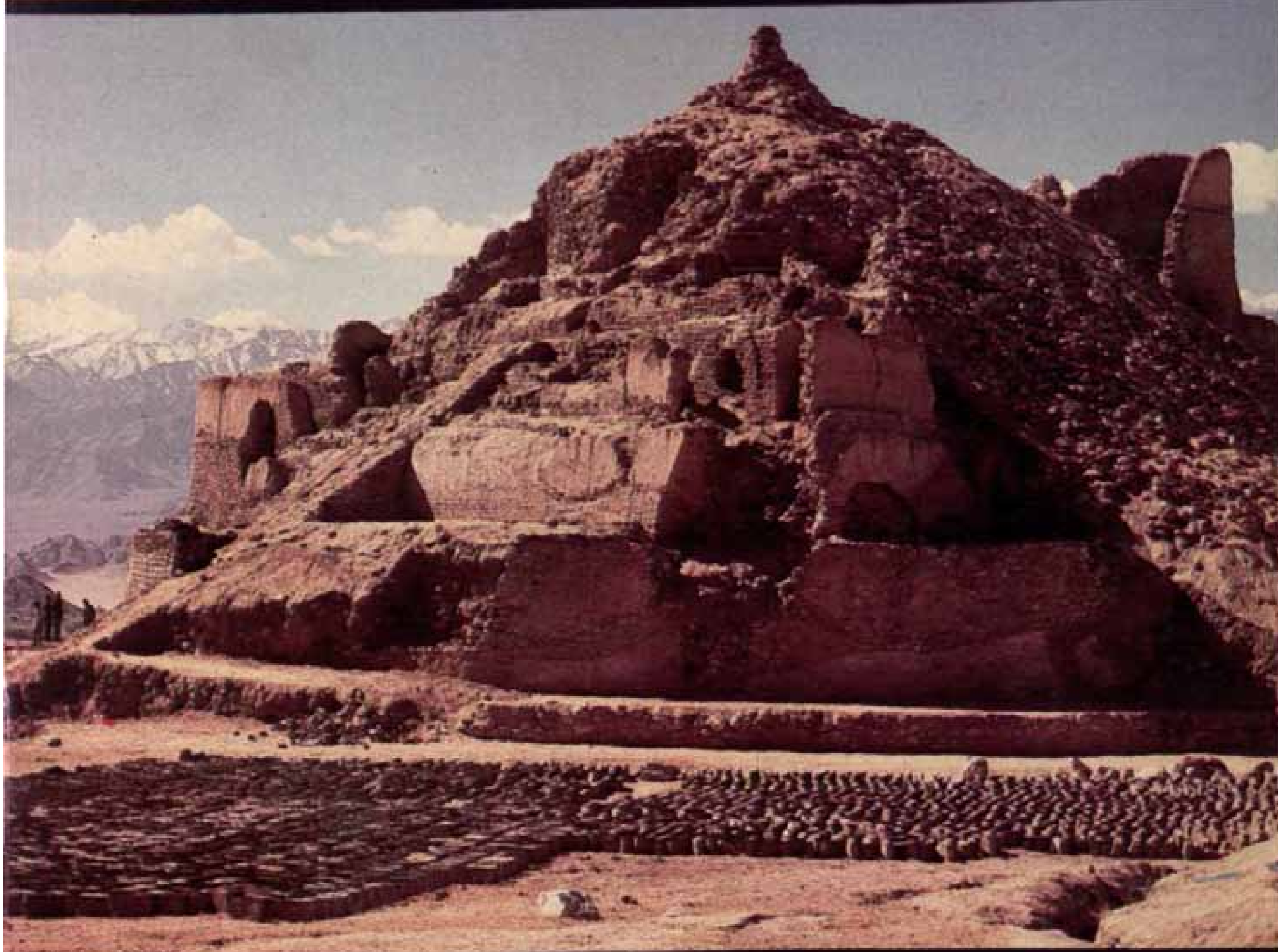
Indian Archaeology

1987-88 — A REVIEW



INDIAN ARCHAEOLOGY 1987-88
—A REVIEW

EDITED BY

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PREFACE

I am happy to place before the scholars the *Indian Archaeology 1987-88—A Review* not very long after the publication of the previous issue. We are making efforts to bring the publication of the *Review* up to date; this, however, would depend on timely submission of material by contributors. It has been our experience that, in many cases, several reminders have to be given for sending material to us for inclusion in the *Review* which results in delay of its publication. I am sure, with the cooperation of different institutions and the State Departments of Archaeology and Museums and my own colleagues in different Branches and Circles of the Survey it would be possible for us to maintain regularity of its publication.

The present issue of the *Review* is more voluminous than the previous ones and thus reflects also increased activities in different fields of archaeology. Out of several excavations reported in this issue, I may mention the work at Banawali, Thanesar, Sanghol, Hampi, Sannathi, Daulatabad, Lalitagiri, Udaigiri, Fatehpur Sikri, Sravasti, Balikeshwar, Chandel, Harsud, etc. by the Survey, at Kuntasi jointly by the Deccan College, Pune, and the Gujarat State Department of Archaeology, at Mangalkot by the University of Calcutta, at Kotasur by the Visvabharati, Maihar by the Allahabad University, Ganeshwar by the Department of Archaeology and Museums, Rajasthan State and at Shikarpur by the Department of Archaeology, Government of Gujarat. It is perhaps not necessary to list the conservation works carried out by the Survey and the different State Departments throughout the length and breadth of the country. However, I may mention that the Survey continued to carry out the major work of structural conservation and chemical preservation of the Angkor Vat temple in Cambodia.

The Survey also established a museum at the Hazarduari Palace in Murshidabad, West Bengal, and the large number of objects in the collection were given detailed chemical treatment.

I am thankful to the Universities, State Governments and other institutions who have contributed to the *Review*. I must also express my thanks to my colleagues in the different Branches and Circles. The responsibility for the information published in the *Review* is that of the contributors.

Finally, I would like to place on record my grateful thanks to my colleagues, particularly to Shri B.M. Pande, Director (Publication) of the Headquarters office of the Survey and his devoted associates namely Shri C. Dorje, Superintending Archaeologist, Dr. Arundhati Banerji, Deputy Superintending Archaeologist, Shri J.C.Gupta, Production Officer and Shri K.P. Padhy and Shri A. Jha, Assistant Archaeologists who worked with efficiency and best of their ability constantly to bring out this volume. It would not have been possible to publish this issue *of Indian Archaeology—A Review* without their involvement under the guidance provided by Shri B.M. Pande. I would like to thank Sarvashri H.S. Miyan, Ramesh Dalai, S.N. Nautiyal and Rakesh Chander of the Drawing Section for making the illustrations press ready. I am also thankful to the staff members of the Publication Branch for their assistance in preparing and typing out the text matter.

New Delhi
21 December 1992 M.C. JOSHI

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INDIAN ARCHAEOLOGY 1987-88 —A REVIEW

I. EXPLORATIONS AND EXCAVATIONS

ANDHRA PRADESH

1. EXPLORATION IN DISTRICT ADILABAD.—The Department of Archaeology and Museums of the Government of Andhra Pradesh reported the discovery of vertebrate fossils belonging to reptilian family (size 40.5 x 3.5 x 12 cm, 41.5 x 33 x 15 cm) located inside the layers of Gondwana rock on the outskirts of Pogadepalli village in the Kundaram Reserve Forest in the district.

2. EXPLORATION IN DISTRICT ANANTAPUR.—About 1800 villages were surveyed in the district by the Department of Archaeology and Museums, Andhra Pradesh, for me preparation of a directory of monuments and antiquities. During the course of the survey, several temples of architectural and historical importance were discovered apart from a number of prehistoric, protohistoric and early medieval sites, loose sculptures of different cults including the *naga* cult, inscriptions, fortification walls, *burji,* bastions, etc. In addition to these, one site with evidence of glass industry was also found.

3. EXCAVATIONS AT MALLIPADU, DISTRICT GUNTUR.—The Department of Archaeology and Museums, Andhra Pradesh, conducted minor excavations at Mallipadu which revealed two cultural phases, I (iron age) and II (early historical). Phase I is characterized by typical megalithic Black-and-red Ware, and Phase II is marked by the occurrence of Rouletted Ware, coins of late Satavahana and Ikshvaku periods, beads and terracotta figurines.

4. EXPLORATION IN DISTRICT GUNTUR.—D. Hanumantha Rao of the Hyderabad Circle of the Archaeological Survey of India[1] discovered several megaliths at Chityala village on the right bank of the river Krishna. These megaliths consist of dolmenoid cists having chambers protruding above the ground. In many cases, the chamber slabs have a port-hole. At Chityala Tanda, a hamlet of the same village, he also found a menhir two metres in height with an anthropomorphic form.

Explorations were conducted at Ketavaram, 5 km south-west of Chityala on the same river bank, which revealed a rectangular fort having circular and square bastions at regular intervals and half-a-dozen temples and *mandapas,* all belonging to the medieval period. Most of them are in a dilapidated condition without any icons inside. In one of the temples, two slabs of *mukhamandapas* bear carvings of ships, which throw some light on the navigation system of the period.

In the vicinity of the Kollur village in the same district, a late medieval Qutb Shahi mosque, temples of stone with brick *sikharas,* dedicated to Siva and Vishnu, loose sculptures of *nagas, naginis,* hero-stones and Nandi, all datable to medieval period, were found.

The Archaeological Survey of India is referred to in the following pages as the Survey.

With the objective of tracing the extension of the rule of the new dynasty (Sada kings), M. Kasturi Bai assisted by Venu Shanker and P. Srinivas Reddy of the Birla Archaeological and Cultural Research Institute, Hyderabad, carried out explorations in the district and discovered following sites:

Taluk	*Village/Site*	*Nature of remains*
Guntur	Mallavaram	Early historical
Narasaraopet	Elchuru	Neolithic to early historical
-do-	Jonnalagadda	Neolithic and early historical
Sattanapalli	Attaluru	Early historical
-do-	Chandavaram	Early historical
-do-	Garapadu	Neolithic to early historical
-do-	Garikapadu	Neolithic to early historical
-do-	Jalalapuram	Neolithic to early historical
-do-	Pondugula	Early historical
-do-	Vipparla	Early historical

Exploration carried out by the Department of Archaeology and Museums, Andhra Pradesh, resulted in the discovery of Palaeolithic, iron age and early historical remains at the village Madduru near Amaravati in Guntur district.

Middle Palaeolithic artefacts comprising scrapers and flakes were noticed across the habitation area of 10 cm thickness, covered by earth washed down from the higher levels of the hill.

Further south, discovery was made of an iron age burial complex containing terracotta sarcophagi in the pits dug into the *murrum* at the foot of the hill alongwith black and red ware sherds.

Explorations in a habitation site at the northern foot of a hillock on the eastern side of the village Madduru yielded remains of early historical period. Sherds of thick black-and-red ware, black ware, red ware of slipped and plain varieties were also found at the site.

5. EXPLORATION IN DISTRICT KARIMNAGAR.—Detailed taphonomical and morphological study of the skeletal remains of *Bos namadicus,* collected from the right bank of the Godavari near the village Servaipet in Karimnagar district was conducted by G.L. Badam of the Deccan College, Post-Graduate and Research Institute, Pune. This is the first discovery of any vertebrate fossil made so far in the lower reaches of the Godavari. It also gives insight into the palaeogeographical distribution of *Bos namadicus* in the Pleistocene deposits of peninsular India. Weathering and diagenesis seem to be the major taphonomic factors operating on the death assemblage at the site. The material seems to be autochthonous and in all probability is derived from one individual only. Interestingly, there are indications of deformity in the axis vertebra and the radius-ulna which might reveal some palaeopathological condition and/or the effect of the sediment load on the material.

6. EXCAVATION AT NELAKONDAPALU, DISTRICT KHAMMAM.—With a view to exposing completely the structural details of the stupa, the site was taken up for excavation for the fifth season by the

Department of Archaeology and Museums, Andhra Pradesh. The excavations revealed the top hub, five-tiered dome (*anda*), drum (*medhi*), the circumambulatory passage (*pradakshinapatha*) along with three *ayaka* platforms and the staircases with landing platforms on either side introduced to the drum, at the four principal cardinal points which were exposed completely. It also brought to light two structural phases in brick masonry.

7. EXPLORATION IN DISTRICT KHAMMAM.—Explorations conducted by the Department of Archaeology and Museums, Andhra Pradesh, in village Vairadhara Annavaram, situated in Veerulapadu Mandal, yielded evidence pertaining to different cultural periods. These include sherds of neolithic pottery, stone axes, megalithic Black-and-red Ware and urn burials. Besides, early historical black-and-red ware sherds in both plain and slipped varieties were also noticed.

8. EXCAVATION AT TAKKELAPADU, DISTRICT KRISHNA.—The Department of Archaeology and Museums, Andhra Pradesh, carried out excavation at two sites in the Takkelapadu village in Jaggeyapeta taluk. In one of these sites were found two to three disturbed courses of brick, a few limestone pieces, fragments of a pedestal probably belonging to a Buddhist image and red-slipped ware. The other habitational site yielded only the pottery of the early historical period. The usual fabrics are red, black and the black-and-red wares. On the basis of these finds, both the sites could be dated between the first and the third century AD.

9. EXPLORATION IN DISTRICT KRISHNA.—The Department of Archaeology and Museums, Andhra Pradesh, reported the discovery of megalithic and early historical sites at Lam situated on Guntur-Amaravati road about 15 km from Guntur. A few megalithic cist burials were noticed on the eastern slope and one on top of the hillock. These oblong burials are oriented east-west. To the west of this megalithic site was found a habitation site datable to first-second century AD which abuts the hill on the eastern side and tapers towards west from the foot of the hill.

Exploration was also carried out at Yeturu, located on the left bank of the river Krishna in Nandigrama taluk, which yielded evidence of a habitation site, datable to the early centuries of the Christian era.

10. EXPLORATIONS IN DISTRICT MAHBUBNAGAR.—A survey of four villages, Garlapalle, Ujjili, Madharam and Somesvarabanda by the Department of Archaeology and Museums, Andhra Pradesh, which are likely to be affected by the construction of a reservoir, brought to light evidence of artifacts of Middle Palaeolithic, neolithic and early historical period. Besides, bangles of early historical period were found.

On the north-eastern outskirts of the village, another ancient habitation site containing remains from neolithic to medieval period, was located. Sculptures of Ganapati and hero-stones, were also found at the site, which is very near the proposed reservoir and is threatened with submergence. The site also yielded neolithic axes, potsherds of black-and-red and black painted on red bowls. At Garlapalle on the left bank of Peddavagu in Maktal taluk, habitation site extending over 5 acres of

land containing remains ranging from the neolithic to early historical period was found. Exploration in the village Kamsanipalle, Kodangal taluk, brought to light protohistoric paintings, figures of bulls, bears, etc., in red ochre, under a huge rock.

The School of History, Culture and Archaeology, Telugu University, Srisailam, carried out explorations in District Mahbubnagar along the ancient footpath from Umamaheswaram to Srisailam on the left bank of the river Krishna and discovered several stone age occupations, temples and remnants of a fortification wall belonging to the medieval period.

Artefact occurrences were noticed at Rasulchervu (16° 15' N; 78° 39' E), Burjgundal (16° 13' N; 78° 38' E), Chaleswaram (16° 11' N; 78° 39' E), Appapur (16° 11' N; 78° 41' E), Borapur (16° 08' N; 78° 42' E), Kadalivanam (16° 08' N; 78° 48' E), Medimankal (16° 07' N; 78° 46' E) and Sangrigundal (16° 06' N; 78° 48' E). The artefacts include few handaxes and cleavers, numerous scrapers on flakes and blades, points, simple and Levallosian flakes, and retouched as well as unretouched blades and cores.

At Rasulchervu, few flakes were noticed scattered at random. Burjgundal appears to be a huge habitation site extending to several hectares. Artefacts of all categories, handaxes, cleavers, flakes, flake tools, blades, and blade tools lie scattered on the surface and the site seems to be a multiculture one. Chaleswaram, Appapur and Borapur have revealed flake-based artefacts and probably represent Middle Palaeolithic occupation. Between Medimankal and Kadalivanam there is a large Lower Paleolithic habitation site. Numerous fine quartzite boulders, cobbles, pebbles and many artefacts lie scattered over a large area extending to several hectares. At Kadalivanam, there is a huge rock shelter measuring about 200 x 100 x 5 metres, a natural spring, a water fall and a hill stream. Blade-based artefacts of the Upper Palaeolithic are found on the surface all around Kadalivanam extending to several hectares. The sediments on the floor of the rock-shelter were removed down to the bedrock and a *Siva-linga* and other related icons were installed in recent times thereby destroying the evidence, if any, of occupation by the Upper Palaeolithic hunter-gatherers. Sanrigundal is a small Chenchu settlement around which are scattered numerous blade-based Upper Palaeolithic artefacts. Here, the raw material, which is fine grained quartzite, is not available and therefore seems to have been brought from elsewhere. The raw material for tools at all the other sites mentioned is medium to fine-grained quartzite and is locally available.

The region under investigation falls under southern tropical dry mixed deciduous forest and has 70% to 90% vegetation cover. Of this, 80% constitute woodland vegetation and the remaining 20% scrub thorny thickets. The mean annual rainfall is 850 mm and the temperature varies between 16° C and 43° C in winter and summer respectively. Food plant and animal species and birds are abundant and varied.

It is interesting to note that this mountainous woodland ecosystem also happens to be the habitat of the Chenchus who are traditional hunter-gatherers. Within a radial distance of 15 kms, at least 14 Chenchu settlements were observed. The households of each settlement vary between 3 and 20. Incidentally, Chenchu settlements also happen to be the habitat of the stone-age hunter-gatherers. Water sources in the form of springs and streams seem to be a decisive factor for the location of settlements of the ethnographic present as well as the prehistoric past. Another interesting feature is

that like the Kung San of the Kalahari and the aborigines of Australia the Chenchus aggregate into larger settlements during rainy season when water is available everywhere and disperse widely to smaller settlements during summer when water is scarce. This phenomenon of dry season dispersion and wet season aggregation among hunter-gatherers of the present as well as recent and remote past in the semi-arid and arid pasts of the world have been reported by several anthropologists. Partially or wholly abandoned Chenchu settlements were noticed at Medimankal, Lingaborre and Pandiborre along the foot path.

The remnants of a ruined wall about 1-5 metres wide looking like a fortification wall, were noticed at many places. It is said to have been running all along the northern ridges of the Nallamalai hill ranges for about 200 kms. The local tradition says that this wall was built by Prataparudra of the Kakatiya dynasty.

At Umamaheswaram (16° 18' N; 78° 41' E), a Siva temple oriented towards north, is built in the middle of the steep hill range overlooking a deep valley. The temple consists of a *garbha-griha, antarala, mukha-mandapa* and a pillared corridor abutting the north and east wall of the *mukha-mandapa.* The rocky shelter serves as the roof of the *garbha-griha* as in a cave temple, but the walls are of masonry. The *garbha-griha* houses the *mukhamandapa* and the corridor has beautiful and ornate pillars in Kakatiya style.

At Populesam (16° 13' N; 78° 38' E) corrupt form of Papanesvara is a small temple called Populesvara temple consisting of *garbha-griha* and *ardha-mandapa.* The superstructure of the *garbh-griha* is of stepped pyramidal type. The presiding deity is in: the form of Siva-*linga*. There is a beautiful loose sculpture of Bhairava within this temple. Based on art and architectural features, this temple may be dated back to thirteenth century AD.

At Chaleswaram (16° 11' N; 78° 36' E) there are two natural caves turned into temples. The first cave is provided with a wall in front having a doorway in the centre. The rock-shelter in front serves as the porch. The doorway has a plain *sakha* and a Gaja-Lakshmi motif in the lintel. On the upper section of the wall there is a *purnaghata* symbol. This shrine houses Siva-*linga* with a round *panavatiam.* There are three loose sculptures representing Virabhadra and two *rishis.* The second cave has brick-built walls which are in a dilapidated condition. This cave shrine also houses Siva-*linga.*

At Borapur (16° 09' N; 78° 41' E), also known as Bhairapur, a late medieval temple was noticed by the side of Bramaramba *cheruvu.* The temple has a large courtyard surrounded by *aprakara* with a *gopura* gateway in the east. There are four shrines within this courtyard which are in a ruined condition. On the tank bund of the Bramaramba *cheruvu* at Borapur a herb-stone with the figure of a handsome youngman dressed as a chief was also noticed.

11. EXCAVATION AT EDITHANUR, DISTRICT MEDAK.—Two find out the relationship between the terracotta images recovered in the rock shelter of Siddheswaragutta and the engravings and paintings in rock shelters of Chawdammagutta, small-scale excavations were conducted by the Department of Archaeology and Museums, Government of Andhra Pradesh, at Edithanur, a small village in Sangareddy Taluk.

Foundation of a rectangular rubble stone structure erected on the natural outcrop of the hillock with circular ovens or hearth with ash and traces of charcoal pieces inside along with a circular ash pit besides it were exposed. A soapstone image of Ganesa, small iron sickle, iron piece, a lump of tin or copper foil were found. A few trenches yielded microliths along with pieces of dull red and black wares.

Trenches excavated inside rock-shelters revealed potsherds at a depth of 2 to 3 cm and microlithic blades and cores were found at a depth varying between 8-20 cm.

The rock painting and engravings could be assigned between mesolithic and megalithic periods.

The terracotta figures from Siddhesvaragutta include bearded human head made of black clay with stout and thick set noses. The portion above the eyebrows of these terracotta figurines is shaped in such a way that it seems to resemble the lower edge of a cloth cap. This along with the dotted lines indicate an attempt to alter the cultural bearings of these objects during the medieval period in order to associate them with the local shrine. Presence of dabber-shaped stone objects also attest this hypothesis since such objects are generally used for keeping on the.four corners over the cloth covering the tomb. It finally suggests that an attempt was made to adapt later religious tradition on these votive *linga*-shaped cylindrical terracotta figurines and to convert them into *gandampeer* worshipped by a local Muslim community.

Thus the antiquities found in Siddhesvara (Sisshula) rock-shelter appear to be collected from elsewhere and placed in the said rock-shelters to establish the religious nature of the rock-shelter as a worshipping place of Siddhesvara during early medieval period, while an attempt was made to associate them with later religious developments of the succeeding period.

12. EXCAVATION AT KOHIR, DISTRICT MEDAK.—An early historical site datable to early centuries of the Christian era was exposed at Kohir by the Department of Archaeology and Museums, Government of Andhra Pradesh. No structures were encountered during the excavation. Red, black, black-and-red and chocolate red wares, figurines and beads of terracotta, stamp with incised flower motiff, glass bangles and pieces of unidentified iron objects are among the finds.

13. EXPLORATION IN DISTRICT MEDAK.—D. Hanumantha Rao, J. Vara Prasad Rao and C. Ramadevi of the Hyderabad Circle of the Survey explored the area near Kohir and discovered a low mound locally known as Pandigadda of late early historical times. Pottery, beads of jasper, chalcedony and terracotta, terracotta objects, bangles of shell and glass, all datable to about fourth-fifth century AD, were collected from the surface of the mound.

14. EXPLORATION IN NARASAPUR, DISTRICT NALGONDA.—In the course of exploration, the Department of Archaeology and Museums, Andhra Pradesh, located eight megalithic cairn circles on either side of the road at Narasapur village, in Atmakur Mandal.

15. EXPLORATION IN DISTRICT NELLORE.—A.V. Siva Sarma of the Hyderabad Circle of the Survey discovered an early historic Buddhist site in Rudrakota, 12 km north of Kavali. The surface finds

include fragments of *chhatri* and a stone piece with lotus motif. A medieval temple was also found in the same village, besides sculptures of Ganesa, Vishnu and hero-stones.

16. EXPLORATION IN DISTRICTS NELLORE AND SRIKAKULAM.—The Department of Archaeology and Museums, Andhra Pradesh, explored the coastal district of Andhra Pradesh to study palaeolithic evidence in the context of fossil beaches for dating the prehistoric material found in the river basins. As a result of this, three fossil beaches were identified at 20 m, 8 m and 4 m height above the mean sea level. No palaeolithic artefacts were associated with 20 m beaches. Man perhaps appeared in the east coast of India in the phase of marine recession which followed the +20 m stand. The lower palaeolithic phase progressed through the phase of marine advance of the +8 m stand, and the late Acheulian continued through the following phase of recession. The middle palaeolithic dates to the period of marine advance to the +3 m stand whereas the upper palaeolithic partly continued into the succeeding phase.

17. EXPLORATION IN DISTRICT PRAKASAM.—In the course of village-to-village survey, P. Sitarama Murthy of the Hyderabad Circle of the Survey discovered the following sites :

Taluk	*Village/Site*	*Nature of remains*
Kanigiri	Ambavaram	Early historical pottery (late phase) and ruined medieval temple
-do-	Chandrasekharapuram	Late medieval temples
-do-	Chennappanayudipalle	Lade medieval temple dedicated to Vishnu
-do-	Dirasavancha	Late medieval temples
-do-	Ganeswarapuram	Lakulisa sculpture
-do-	Punugodu	Late medieval temples

18. EXPLORATION IN DISTRICT RANGA REDDY.—D. Hanumantha Rao and J. Vara Prasada Rao of the Hyderbad Circle of the Survey discovered an extensive megalithic site 1 km south of Manneguda on the Hyderabad-Pargi road. There are two low laterite hillocks strewn with several megalithic circles of different dimensions ranging in diameter from 5-10 m.

19. EXCAVATIONS AT THOTLAKONDA, DISTRICT VISHAKHAPATNAM.—Excavations at Thotlakonda by the Department of Archaeology and Museums, Government of Andhra Pradesh, revealed a Buddhist site which was located abutting the sea coast 15 km from Vishakhapatnam along the beach road. It commands a panoramic view of the area, overlooking the Bay of Bengal.

The structural remains exposed here include pillared hall, stupas with their usual components, sculptured pillars and viharas.

A good number of sculptured pillars, pilasters, railing upright, *chhatra* pieces with early Brahmi letters, *Buddha-padas* with auspicious symbols, *harmika* with *amalaka* motifs were found on the north-eastern part of the settlement. Fallen pillared congregation hall with a variety of pillars in different sizes at the centre of the habitation is a unique feature of the site.

Basing on the datable material obtained from the excavations as well as surface which includes pottery, coin and label inscriptions engraved on *chhatra* slabs, the site of Thotlakonda seems to have flourished from second-first century BC to first-second century AD.

20. EXPLORATION IN DISTRICT VISHAKHAPATNAM.—In the course of exploration, D. Hanumantha Rao and J. Vara Prasada Rao of the Hyderabad Circle of the Survey noticed foundations of an early medieval brick temple-complex at Kotauratla, 14 km south-east of Narsipatnam, besides a few sculptures of Kukkutesvara, Nandi, Ganesa, Sarasvati, Vishnu, Bhairava and Mahishasuramardini which are datable to about the eighth-ninth century. The size of the brick measures 35 x 20 x 7 cm.

21. EXPLORATION IN DISTRICT WARANGAL.—J. Vara Prasada Rao of the Hyderabad Circle of the Survey discovered a late Kakatiya temple in a dilapidated condition at Gundratimadugu, 80 km east of Warangal in the direction of Kazipet-Vijayawada railway line. The significant feature of this temple is the lofty square brick *vimana* of three *talas,* with intervening recessed *grivas.* The *talas* consist of a series of *kutas, panjaras* and *salas* on the four sides of the *vimana.* Th recessed *grivas* were embellished with *vyala* and dwarf figures in stucco on brickwork. The lofty *vimana* recalls and resembles the Vijayanagara temple *gopura* architecture which is uncommon in the area.

ASSAM

22. EXCAVATION AT AMBARI, DISTRICT GUWAHATI.—In continuation to the earlier excavations (*Indian Archaeology 1969-70—A Review* and *Indian Archaeology 1970-71—A Review*[1]) work was resumed at Ambari under the direction of T.C. Sharma of the Department of Anthropology, Gauhati University, with assistance from G.N. Bhuyan, Director of Archaeology, Assam, Minerva Sonawal, Bhaskar Jyoti Das, Nripen Roy, Bonani Deka, Binita Baishya, Pallabi Rabha and Uddalak Datta.

Three trenches (AMB IVA, AMB VA and AMB VIA), measuring 5 metre square, were exposed to an average depth of 2.10 metres below which there occured subsoil water level. A large number of dressed stone blocks as well as sculptures belonging to seventh-eighth century AD were recovered below the subsoil water level. It was observed that there are cultural relics of much earlier periods of ancient Pragyotishpura below the subsoil water level.

The most important finds of structural remains comprised of bricks and ornamental stone blocks of gneissic rock. In the trench, AMB IVA, six brick structures of different cultural periods belonging to Period I (*circa* seventh to thirteenth century AD) were exposed. Below the brick structure, were stone architectural remains of still earlier period, which could not be fully recovered as those were

[1]This publication is referred to in the following pages by the year only.

below the subsoil water level. Likewise, in all the excavated trenches structural remains of bricks and stone have been exposed.

Pottery of various colours, designs and shape was found in profuse quantity in the excavation. The most important and significant are the kaolin wares which were found in large quantity.

Apart from the kaolin wares, Muslim green-glazed ware of the Ahom-Mughal period and Chinese celadon ware of the fifteenth-sixteenth century AD were also found in the upper layers.

The most significant find in the excavation are the Brahmanical icons of which 135 have been recovered so far in addition to a large number of Siva-*linga* and *yoni-pithas.* The icons comprise fifty-five images of Durga, thirty-seven of Vishnu, forty-one *yonipithas,* all finely carved in granite.

All these antiquities, except the *gaja-vyalas,* were recovered from a single trench, AMB VIA, at a depth ranging between 200 in and 2.10 m.

Apart from these icons, various stone blocks, featuring architectural designs such as capital, pillar-base, etc., were also recovered from the trenches. A tool for sharpening and grinding stone, having a smooth facet was found.

Other finds from the excavation of this season include eleven copper coins of the British period, sixty-four Siva-*lingas* of terracotta, terracotta beads and balls, four carnelian and five coral beads, pieces of green glass and bangles and cannon balls.

The discovery of partly dressed stone blocks, partly carved icons, undressed stone blocks as well as the grinding stone suggest that the site was sculptors' colony of the Varman and Post-Varman dynasties (seventh-tenth centuries AD). Further, the discovery of a large number of stone images in undamaged condition suggests that some of the brick structures exposed in the excavation were actually artists' studios where the images were stored for exports.

BIHAR

23. EXPLORATION IN DISTRICT BHAGALPUR.—In the course of village-to-village survey, K.P. Choudhary of the Patna Circle of the Survey located a brick built temple dedicated to Radha and Krishna in the village of Jandaha.

24. EXCAVATION AT TARADHI (BODH GAYA), DISTRICT GAYA.—In continuation of last season's work (*1986-87,* pp. 23-24) the Directorate of Archaeology, Government of Bihar, under the guidance of Ajit Kumar Prasad, assisted by Jaya Prakash Narayan Singh, Shiya Sharan Singh, Sanjiv Ranjan and Dinesh Prasad Gupta, resumed excavation at Taradih mound under the general supervision of Prakash Charan Prasad. The main objectives of this year's operation were to spot out the brick built monastic complex of the Pala period; to ascertain its extent and to determine different structural phases; and to get more details of the neolithic and chalcolithic cultures.

A neolithic horizon overlying the natural soil was found in the course of the excavations.

Period I was distinguished by neolithic deposits. The pottery was mainly handmade, comprising burnished and plain red ware, and some examples of cord-impressed sherds as well. The red ware had different shades such as light red, deep red, chocolate red, etc. The important types included vases

with flared rim and narrow mouth, *fiandis* with out-turned rim, ring-based bowls, storage jars, miniature pots, etc. Some burnished sherds bore irregular scratches.

Some hearths of different shapes and size were also found in the course of excavations.

On the basis of pottery, Period I may be further divided into two sub-phases, 'A' and 'B'. Phase A had deposits associated with a handmade red ware, the ceramic types being *handis,* vases, bowls, jars, etc. A few cord-impressed wares were also found.

Phase B was marked by the appearance of burnished grey ware. Pottery of this phase was also handmade, the types being *handis,* bases, bowls, jars, etc. The cooking vessels usually had rusticated bases; the red ware and cord-impressed pottery of the previous phase continued.

The notable antiquities of bone included points, pins, arrowheads, etc.

Period II was represented by chalcolithic deposits. The pottery of this period was generally wheelmade, though handmade pottery of the previous still continued to be in use though with lesser frequency.

Period II was also distinguished by the appearance of copper and the black-and-red ware. The pottery was predominantly red ware, though specimens of black-and-red and black wares were also found in good number. The pottery had usually thick slip of red colour, of different hues such as chocolate red, light red, orange to ochre red, deep red, brick red, etc.

The important pottery types included vases, *handis,* rimless *handis,* storage jars, dishes, dishes-on-stand, bowls-on-stand, lipped-bowls, bowls with globular profile and outcurved featureless rim, perforated bowls, basins, etc. Some pottery pieces bore white painting in the form of dots, strokes, way lines, etc. A few sherds were decorated with incised parallel lines, criss-cross, diamond, etc. A few larger pots like the storage-jars were decorated with thumb- and rope-impressed designs. Important antiquities of terracotta included bangles, beads, balls, etc. Among other notable finds are a copper finger ring, bone arrowheads, points, pins, styluses, etc. A good number of disc-shaped tiny steatite and stone beads, balls, etc. were also found.

Period III was distinguished by the appearance of iron and black slipped ware. The black-and-red, black, and red wares of the earlier period continued in this period but improved in quality. These were made of well-levigated clay and were well-fired. Large pottery pieces show the evidence of paddy husks. The main pottery types included deep bowls, lipped-bowls, *lota*-shaped bowls, *handis,* rimless *handis,* basins, etc. The important antiquities were stone beads, balls, conical-shaped objects, bone arrowheads, points, pins, terracotta spindle whorls, ear-lobes, beads, etc. Iron slag was also found in the course of excavations.

Period IV was marked by the appearance of the Northern Black Polished Ware (hereafter NBP) though black-and-red ware still continued in less frequency and new types in red ware and black ware made their appearance in this period. Specimens of both plain and slipped red ware are also met with. The noteworthy types included vases of outcurved thickened rim and outcurved beaded rim, dishes with sharp carination at the base, bowls with evened rim, bowls with horizontally splayed-out rim, basins with beaded rim, lipped-basins, lid-cum-bowls, flat-based bowls, troughs, etc.

Among other important finds are bone arrowheads, points, pins, stone beads, balls, and terracotta beads, earlobes, discs, gamesmen, etc.

Period V was represented by the Kushana red ware, the important types being *surahi,* vases, flat-based bowls, frying-pans, etc. Among antiquities, mention may be made of beads of stone, glass and terracotta, glass and terracotta bangles, terracotta animal figurine and iron nails.

Period VI was marked by the appearance of Gupta and late Gupta antiquities along with structural remains of burnt brick of the period. Notable objects of stone were beads, votive stupas, *chhatravalis,* pedestal, images of Buddha and terracotta objects which included beads, earlobes, conical objects and seals and sealings.

Period VII was distinguished by antiquities of the Pala period and remains of a monastery-complex, terracotta seals and sealings, votive stupas, *chhatravalis,* etc.

25. EXCAVATION AT KUSHI, DISTRICT MUZAFFARPUR.—The Patna Circle of the Survey under the direction of B.K. Saran, assisted by B. Nath, Sunil Kumar, Saptarshi Kumar and K.C. Shrivastava carried out a small scale excavation. The excavation revealed five layers. The first layer, of hard compact soil having grey colour patches, has no antiquity. The second layer is of loose blackish soil with a deposit of 1.50 m to 2.00 m. This is the only layer which has yielded antiquities such as terracotta human figures, variety of beads and balls, conical objects and seal and sealing.

On the south-western corner of the mound remains of a semi circular brick platform were exposed, the diameter of which is 1.95 m and contains five courses of brickbats.

Few sherds of red ware, decorated and stamped with incised designs of fish and flowers were also found. The shapes included dishes, storage jars, *lota,* bowl, pitcher, *handi,* lamps, spouted pots, etc.

26. EXCAVATION AT MANER, DISTRICT PATNA.—In continuation of the previous year's work (*1986-87,* pp. 25-26), the Department of Ancient Indian History and Archaeology, Patna University, resumed the excavation at Maner. The work was directed jointly by B. Narayan and A.K. Singh under the overall supervision of B. Sahai, with assistance received amongst others from J.P. Singh, L.K. Prasad, R.N. Singh and P.K. Bose.

The main objective of this year's excavation was to trace the extension of the structure-complex showing room-like formations and floor of the Pala period, which was partly exposed earlier. Three extension trenches, each measuring 6 x 4 m, were taken up for excavation work towards the eastern side of MNR-2.

Excavation in the extended area revealed that the floor showing the drain in one of its corners formed part of a courtyard. The courtyard, in turn, was enclosed by a brick-built passage plastered with *surkhi* and lime. The passage in question stretched towards north-east and also towards southeast and south-west. Towards the eastern side of the north-east running passage, a row of three rooms was noticed. The central room of this row had all the four arms intact while the other two on its northern and southern sides showed respectively two and three arms of the roomlike formation. Another row of three rooms lay towards the western side of the north-east running passage, which was partly exposed earlier. The central room in this row had all the four arms, while the other two roomlike formations on its northern and southern sides showed three and two arms respectively.

Towards the southern side of the south-east and south-west running passage, a row of two rooms was noticed. The room on the south-western side had all the four arms of the room like formation. Curiously enough, a roomlike formation consisting of two arms only was noticed towards the western side of the courtyard.

All the rooms with four walls vary in size, with the bigger one measuring 2.83 x 2.22 m; the other two respectively measure 2.73 x 2.28 m and 2.3 x 1.42 m. The extant height of the walls of the rooms range between 0.87 m and 1.2 m.

The whole of the structure-complex was found resting over layer 3, which was composed of compact yellowish soil. The structure-complex in question was sealed by layer 2, which was composed of compact soil of light grey colour mixed with brickbats and its average thickness was 0.56 m. The notable antiquities obtained from layer 2 include terracotta female head, horse rider, seated elephant, bird figurines, broken iron spearhead, bone point, terracotta and stone beads, etc. Layer 1 of the trench divisible into five sub-layers was composed of somewhat compact and loose soil deposits mixed with brickbats and potsherds and its total thickness was around 1.71 m. It had yielded mainly mixed materials of different kinds including green glazed sherds of early medieval period, but special mention may be made of the discovery of an iron sword and an iron chopper like tool which were obtained from the lower part of this deposit.

The area between XVII to XIX was also dug up to the NBP level. Excavation in this area had revealed a small brick wall of three courses which was found running near the corner of the eastern section. The wall in question was sealed by layer 3 and it rested over layer 4. The antiquities obtained from layer 3 include a terracotta figurine, some iron objects including a broken spearhead and bone points. An inscribed glass sealing was found from a pit, which was sealed by layer 3. The inscribed letters of this sealing may be ascribed on a palaeographic grounds to the period between first century BC and first century AD. Layer 4 and 5 of this area yielded NBP sherds and other associated wares. The notable finds from these layers include a beautiful bone stylus, copper antimony rod, terracotta and stone beads, etc.

27. EXPLORATION IN DISTRICT RANCHI.—In the course of village-to-village survey, S. Kumar of the Patna Circle of the Survey brought to light a medieval site yielding red ware at Ekambe and megalithic burials and sandstone sculptures of fifteenth century at Sutimbe.

28. EXCAVATION AT RAJMAHAL, JHIMJHIMIA-KALISTHAN, DISTRICT SAHEBGANJ.—Under the general supervision of Prakash Charan Prasad and Ram Shekhar Singh, assisted by J. Akhtar, N.C. Ghosh and D.P. Gupta of the Directorate of Archaeology, Government of Bihar, conducted a trial excavation at Jhimjhimia-Kalisthan, in village Turtipur, 3 km to the south-west of Rajmahal (Lat 25° 3' N; Long 87° 50' E. The site is situated to the southern side of a shallow lane and includes five villages Malkasaba, Fulbagh, Turtipur, Begampur and Gadaganja. At the northern end of these villages, there is a brick rampart along the lake. The main objective of this year’s excavation was to unravel the cultural sequence of the site. Earlier explorations of the area had yielded black and red, NBP, red, black, black-slipped, grey and Muslim glazed wares, Chinese porcelain, Persian tiles, etc.

A trench measuring 5 x 5 metres was laid out at the village Turtipur near Jhimjhimia-Kalisthan. It revealed remains of three periods comprising materials associated with the NBP ware, the post NBP period datable between the second century BC and second century AD, and the Indo-Islamic period.

The pottery collected from Period I comprised the NBP, black, black-slipped, grey and red wares. The pottery is mainly wheel-turned and well-fired, the noteworthy shapes include the vase, *handis,* storage jars, bowls, dishes, basins, lid-cum-bowls, etc. A few black-slipped sherds having graffiti marks were also encountered. Conical bowl with splayed-out rim, perforated bowls, lipped bowls in red ware are also worth mentioning.

Among associated finds are beads of semiprecious stones, bangles, pestles, etc., animal and human figurines, balls, *ghata*-shaped beads of terracotta, tanged and socketed arrowheads, and disc of bone, iron chisel and nails and iron slag, copper antimony rods and wires. Remnants of burnt clay with reed impressions indicate that hutments during this period were of wattle-and-daub.

Period II was marked by the appearance of pottery and antiquities datable between the second century BC and second century AD. Mainly red ware was found though some sherds of black-slipped, black and grey wares were also met with, the types being bowls, vases, narrow-necked vessel, lid-cum-bowls, plates, spouts, etc. Some of the red ware vessels were having slip or wash. The antiquities of the period comprised terracotta animals, beads, balls, etc.

A thin whitish layer of silt was noticed at the top layer of Period II below which weathered sherds were found. It shows that the site was deserted for a long time at this particular site, prior to the next occupation.

Period III was marked by the appearance of green, yellow and bluish glazed ware as well as Chinese porcelain of the medieval period, red slipped and red wares without any wash or slip, fragments of wide-mouthed jars, cooking vessels with soot marks, basins, vases, *handis,* plates, bowls, miniature pots of medium fabric in red ware. Lamps (*dipa*) of dull red ware with a lip for the wick, devoid of any wash or slip, lamp of red ware with incurved rim and a widened lip for the wick and treated with a wash on the exterior only were also picked up. A few such lamps had soot-marks at the lip too. The neck portions of *huqqa* and *chilams* both in black and red colour were also met with. A few flower-shaped *chilams* with yellow coating were collected. A few pieces of Persian tiles were also met with. Two hearths were noticed from this period. A terracotta male head and iron objects were also found.

29. EXPLORATION IN DISTRICT SARAN.—K.C. Shrivastava of the Patna Circle of the Survey, during village-to-village survey, located *ekamukha* Siva-*linga* in black basalt from Narainpur. It is assign able to late medieval period.

GUJARAT

30. EXPLORATION IN DISTRICTS BHARUCH AND VADODARA.—K.P. Mohandas and K.D. Tripathi of the Vadodara Circle of the Survey conducted exploration in Bharuch and Vadodara districts and brought to light late medieval temples at the following sites :

District	*Taluk*	*Village*
Bharuch	Nandod	Jior
-do-	-do-	Kumbeshwar
-do-	-do-	Sukhadcv
Vadodara	Dabhoi	Chandod
-do-	-do-	Karnali
-do-	Karjan	Alampura
-do-	-do-	Moti Korall
-do-	Sinor	Sinor
-do-	Talakwada	Talakwada

31. EXCAVATION AT SHIKARPUR (VALMIYO TIMBO), DISTRICT KUTCH.—Excavations were taken up by the Department of Archaeology, Government of Gujarat, under the direction of M.H. Raval, assisted by D.P. Mehta, M.D. Varma, J.D. Trivedi and S.P. Mehta at Shikarpur (23° 16' N; 70° 41' E), a Harappan site in Taluk Bhachau of the District.

This season's excavations were planned for testing the stratigraphy and chronology of the site for further extensive, well-planned horizontal excavation.

The site of Shikarpur, known as Valmiyo Timbo, is situated just adjoining to the National Highway No. 8A, leading to the Kandla Port on the Gulf of Kutch. Actually the mounds are located at a distance of about 5 km to the south-west of the village Shikarpur. The site comprising three inter-connected mounds, is about 2 to 3 km north of the eastern tip of the Gulf of Kutch. A dried-up sand-filled river-bed just to the west of the site is an interesting topographic feature. This perhaps might have been a link with the sea.

These three archaeological mounds cover an area of 236 m east-west x 224 m north-south. Roughly, there are two main parallel twin mounds running east-west and rising to the height of 5 to 6 m, from the surrounding ground level. The third lower mound (height 1.5 m) is to the south and south-west of these twin mounds. This mound is more ashy indicating some firing activity. The slopes of about 30 degrees are all around the site with a deep cutting between the main twin mound. The entire mound is strewn with potsherds, small rubbles and occasionally antiquities like beads, chert blades, terracotta objects, etc. Large number of rubbles indicate rubble structures within the mound.

Pottery from the surface comprised of the reserved slip ware, Harappan red ware and other allied pottery.

Three trial trenches measuring 5 m x 10 m were laid on the top of the three mounds and a section cutting of 5 m x 1.55 m was also undertaken in the rain gully between the twin mounds. In the deepest trench Cl on the mound II upto the depth of 300 m, ten layers were encountered before reaching the natural soil. In the remaining trenches mud brick structures were encountered.

The upper five layers were highly disturbed layers of loose ashy earth and high patches of white and grey ash probably indicating a huge destructive fire. Habitation layer 6 and 7 are marked by mud brick structures particularly exposed in trench Al and C. Layers 7 to 9 were slightly compact

brownish earth revealing most of the Mature Harappan pottery and antiquities. Layer 9 in trench C is marked by mud brick structure. Again, layer 10 is marked by Early Harappan material. Thus stratigraphy probably reveals three to four habitation levels marked by mud brick structures and hearth. The last habitation level layer 4 is marked by rubble structure. The topmost three ashy layers indicate fire and final desertion of site.

The structures are both of rubble (last phase) as well as mud bricks (two early phases). One of the structures No. 4 in trench A is particularly interesting. It is a north-south running floor like structure composed of mud bricks (35 x 20 x 10 cm) and black clay mortar. The bricks used in this are of three colours—greyish, light yellowish brown and dark brown and are laid in a regular rectangular chequer pattern arranged in contrasting colours.

Three to four circular and oval hearths with red baked outer lining were also encountered.

The pottery is typical Mature to Late Harappan including Harappan red ware, chocolate-slipped ware, cream-slipped ware, buff ware, polychrome ware, perforated, coarse gritty ware, etc. In addition to this, quite a number of reserved slipped ware sherds were also found. Another interesting ware is glazed ware of various grades. A few sherds of painted black and red ware were also collected. The main forms are storage jars, globular pots, dish-on-stand, basins, vases, vertical perforated pots, dishes, bowls, troughs, etc.

Two potsherds with Harappan letters were also found. One of them is a fragment of painted red ware with incised vertical fish symbol. The second sherd is a fragment of a chocolate coloured bowl with rhomboid symbol with a double cross, and has geometric decorations like intersecting circles, loops, diamonds, chevrons, straight and wavy lines and dots. Miniature pots of toys were also found.

A number of terracotta bull, ram and toycart frames, beads, marbles, fragments of bangles were also found.

Inspite of the limited excavation hundreds of triangular cakes varying in size and shapes were found.

A variety of semiprecious stone beads and pendants of agate, carnelian, jasper and chert of different shapes were found. Steatite micro-beads were found in plenty. Apart from disc beads and water beads of steatite dentalium, chank and paste beads were also found.

Copper ring, bangles, chisels etc., fragments of chert blades of varying size, fine drill bits, variety of stone drills are some of the other finds.

A large number of fragments of chank bangles alongwith chank slices, discarded waste materials of chank etc., brought out by the excavation indicate the existence of chank industry.

32. EXPLORATION AROUND DHOLAVIRA, DISTRICT KUTCH.—L.S. Rao and V.H. Parmar of the Excavation Branch V of the Survey discovered an ancient water reservoir built across a seasonal *nalah,* locally known as the Kharodawali river. Situated to the south-east of the famous Indus Kotada mound at a distance of about 2 km, the reservoir is constructed of mud embankment provided partly with stone boulder veneering and partly by dry masonry wall.

The dam, oriented in north-west and south-east direction, measures approximately 350 m in length. Perhaps during its heyday it must have held water covering an area of about 15-20 acres.

Interestingly, the upstream banks on either side of the dam exhibit traits of structural remains in whose association large quantity of conch-shells, mostly waste material scattered around could be noticed. The occurrence of pottery accompanied with conch shell waste in the surrounding area indicated this structure being of the early historical period.

L.S. Rao and V.H. Parmar also discovered a subsidiary settlement of the Harappans at Dholavira. The site located on the eastern bank of a seasonal *nalah* locally called Khorodawali river, lies almost half way between the Indus Kotada mound and the newly discovered ancient water reservoir. The built-up area of the site measures about 75 x 35 m. The greater axis following the river bank runs in north-south direction. The prominent architectural features of the structural remains on the surface are akin to those of fortification walls of the Indus Kotada mound. Besides, as the surface features indicate there are structures of smaller dimension built either on rectangular or square plan. Since the structures are highly disturbed it is difficult to ascertain their function.

However, it may be pointed out that the cultural assemblage of Harappans has drawn blank. But the architectural style of the structural remains strongly indicates that this site also belongs to the Harappans.

33. EXPLORATIONS IN DISTRICTS MAHESANA AND VADODARA.—The Department of Archaeology of the Government of Gujarat took up the village-to-village survey in Harij Taluk of Mahesana district and Dabhoi and Shinor taluks of Vadodara district and following villages/sites of archaeological interest were discovered:

District	*Taluk*	*Village/site*	*Nature of remains*
Mahesana	Harij	Govna	Medieval
-do-	-do-	Jamanpur	Medieval
-do-	-do-	Jaska	Medieval
-do-	-do-	Piluvada	Medieval
-do-	-do-	Vansa	Medieval
Vadodara	Dabhoi	Bamboj	Medieval
-do-	-do-	Bhimpura (Kukad)	Microlithic
-do-	-do-	Bhimpura (Phoolwadi)	Microlithic
-do-	-do-	Chandod	Medieval
-do-	-do-	Karali	Medieval
-do-	-do-	Karner	Microliths
-do-	-do-	Kukad	Late medieval
-do-	-do-	Naranpura	Medieval
-do-	-do-	Navi Mangrol	Medieval
-do-	-do-	Pargam	Medieval
-do-	-do-	Sathod	Medieval
-do-	-do-	Sitapur	Microlithic and medieval
-do-	-do-	Ten	Medieval
-do-	-do-	Vadaj	Medieval and late medieval

34. EXCAVATION AT UMTA, DISTRICT MAHESANA.—An excavation of the mound at village Umta, known as Rajgadhi mound in Visnagar taluk of the district, was carried out under the direction of B.S. Makwana, of the Department of Archaeology of the Government of Gujarat, assisted by H.S. Shah and O.P. Ajwalia. An area of 8 x 8 m and 5 x 10 m on the western side of the mound was taken up for excavation.

The excavation was undertaken upto 1.5 m to 200 m depth, but no clear chronological sequence of structures could be traced and only pieces of Sultanate and Mughal bricks and lime flooring, pottery fragments including black and red wares, pieces of glazed ware, glazed roof tile as well as pieces of human and animal-shaped toys, toy-cart wheel, were found.

35. EXCAVATIONS AT KUNTASI, DISTRICT RAJKOT.—Excavations at Kuntasi in Maliya Taluk were carried out by M.K. Dhavalikar, Vasant Shinde and Shubhangana Atre of the Deccan College, Post-Graduate and Research Institute, Pune, in collaboration with M.S. Raval and Y.M. Chitalwala of the Department of Archaeology, Government of Gujarat, with assistance from R.K. Mohanty, P.P. Dandawate, Y.S. Rasar, V.G. Vishwasrao, C.G. Padwal and P.D. Chudasama.

Kuntasi is situated 30 km to the north-west of Morvi. The ancient site (Lat 22° 54' 40" N; Long 70° 37' 30" E), locally known as Bibino Timbo, is located 3 km to the south-east of the present village. It is spread over an area of about 220 m (N-S) and 150 m (E-W) with a maximum habitational deposit of about 7 m. The excavation was undertaken with twofold objectives : to trace the evolution of Late Harappan from the Mature Harappan; and to study the socio-economic organization of the Harappans by employing the conjunctive approach.

The excavation revealed a twofold sequence of cultures viz. Period I : Mature Harappan (c. 2300-1900 BC) and Period II: Late Harappan (c. 1900-1700 BC). Of the total cultural debris of about 7 m, the upper 2 m belongs to the Late Harappan, the lower 5 m represents the Mature Harappan.

Period I (Mature Harappa): The excavations revealed that the citadel mound was protected by a double fortification wall of stone rubble set in mud masonry. It is roughly squarish on plan (93 m N-S x 83 m E-W) and has a squarish watch tower in the south-western corner which is similar in construction. It is built of large flat stones at the base and also along the margin, whereas in the middle it has been packed with stone rubble. The bastion is roughly squarish on plan and measures 8.50 m (N-S) and 10-55 m (E-W). Only four of its courses now survive and its extant height is 60 cm. The outer fortification wall was built of large boulders whereas the inner one had smaller stones. The inner wall which emanates from the watch tower in the south-western corner, was about 1 to 1.2 m wide but in the middle it broadened to about 2.5 m, rendering it the appearance of a landing platform because of its slope.

The outer fortification wall, which was partly exposed on the southern periphery, takes a turn in the southeastern corner of the mound and runs towards north where it broadens from 1.20 m to 3.30 m. Further up towards north where there is a steep rise, there is a ramp, 4.10m wide, joining the inner wall at a distance of 9.50 m. In this area of 9.50 m x 4.10 m are set large stones in mud masonry. It is highly likely that this served as a landing platform for going down to the river for loading-unloading cargo in boats.

This year the excavation was confined mostly to the western pan of the main citadel mound. In Sq. OD1 was unearthed a kiln, which resembles a huge hemispherical cauldron, made of clay, which was periodically plastered with clay. Its maximum diameter is 1.65 m and the extant depth is 50 cm. At the bottom of the kiln, in the centre, was found ash over which were lying fragments of a storage jar. The kiln had sand packing all around, and was supported, at the base, by stones. The sand packing was obviously meant for sandbath for maintaining heat in the kiln. Stratigraphically the kiln belongs to the Mature Harappan. Yet another pottery kiln represented by an open shallow pit was encountered in the earliest levels of Period I. It is roughly circular on plan (dia. 3 m) and resembles the pre-Harappan open kiln at Mehrgarh.

The structure complex that was exposed on the western side consists of large narrow chambers. They are built of stone rubble set in mud masonry. At places the walls had basal courses of stone over which was a mud wall. Besides, the use of mud bricks (9 x 18 x 36 cm) conforming to the Harappan standard has also been attested. The structure complex has yielded no evidence of domestic hearths and has no well made floors. Only structure Nos. 7 and 8 have a number of storage chambers and silos whereas the other structure (Nos. 9, 10, 11 and 12) is full of what appears to be furnaces and kilns. This leads us to surmise that the structure complex was not used for residential purposes but served as a workshop and storehouse.

Structure 8 is a large room (5.30 m wide and 4.75 m long), which has been divided into different chambers by mud brick walls. There is a narrow chamber along the northern margin (4.80 m E-W x 1.45 m N-S). In the floor of the chamber are three sites dug into the ground which are lined with mud. The easternmost has a diameter of 70 cm and is 50 cm deep. The central one is shallow (dia. 1.20 m and 25 cm deep). The third by its side on the south-west has a diameter of 60 cm and is 30 cm deep. In the western half of Structure 8 and in the southern part is yet another shallow chamber (2.30 m long, 1.60 m wide and 1.5 m deep). In the eastern half are two more, one large (1.50 m x 1.70 m x 60 cm deep) and the other narrow (1.50 m x 65 cm x 60 cm). It is highly likely that the small chambers formed of mud-bricks were used for storage.

Period II (Late Harappa): In one of the structures (ST 3) in the uppermost levels (Late Harappa) was encountered a furnace probably for smelting copper. Its longer axis is in the southwest-northeast direction and on plan it is circular with a narrow channel. Its walls are made of clods of earth which have been burnt hard. Its extant depth is 25 cm. The inner diameter of the furnace is 70 cm and the channel is 45 cm long and 20 cm wide. In structure 1 was encountered a burial of an adult in an extended posture in a pit. The skeleton was in a supine position with the head towards the north and the legs towards the south. It is in an excellent state of preservation.

The excavation has yielded typical Harappan painted pottery, long tubular carnelian beads, cubical chert weights, terracotta can frame, etc., but no Harappan seal has so far been found. Among the pottery forms are perforated jars, profusely painted "S" shaped vases, goblets and bowls with short stud handle. The painted designs are executed in black pigment which include geometric, floral and animal motifs.

This season's work indicates that the Harappan settlement at Kuntasi played an important role in their activity. It was not an agricultural settlement but was a centre for acquiring and processing

raw materials for manufacturing articles for export. The geomorphological studies suggest that Kuntasi may have been a creek port during Harappan period. The discovery of landing platform, anchor stones, etc., corroborate the hypothesis.

36. EXPLORATION IN DISTRICT SURAT.—In the course of village-to-village survey Vilas Jadhav of the Vadodara Circle of the Survey brought to light the following sites of archaeological interest.

Taluk	*Site/Villages*	*Nature of remains*
Nizar	Adad	Medieval habitation mound
-do-	Bhavali	Palaeoliths
-do-	Borda	Late medieval brick temple
-do-	Boripaha	Late medieval wooden memorial pillars
-do-	Devpan	Late medieval hero-stones
-do-	Hardoli	Medieval Hanuman sculptures
-do-	Khurda	Medieval sculpture of Vishnu
-do-	Khonora	Microliths
-do-	Lakhamikeda	Late medieval hero-stones and wooden memorial pillars
-do-	Lekurwali	Late medieval sculpture of Vishnu
-do-	Raighad	Hero-stones and step-wells
-do-	Ramaki-Talav	Medieval Hanuman sculpture
-do-	Sayala	Hero-stones
-do-	Velda	Hero-stones, sculptures of Ganesa, Vishnu, Nandi and four Tirthankara heads.
Songhad	Chimkuva	Medieval Hanuman sculpture
-do-	Jamkhadi	Microliths
-do-	Khokhasa	Hero-stone
-do-	Kikakui	Microliths
-do-Uc	Tokarva	Hero-stone
chal	Kachali	Parvati sculpture
-do-	Pethapur	Hero-stones
-do-	Sus	Hanumana scupture and hero-stones

37. EXCAVATION AT NAGWADA, DISTRICT SURENDRANAGAR.—In continuation of previous season's work (*1986-87,* pp. 30-31) K.T.M. Hegde, assisted by V.H. Sonawane, V.S. Parekh, K.K. Bhan, K. Krishnan and Ajit Prasad of the Department of Archaeology and Ancient History of the M.S. University of Baroda, resumed further excavation at Nagwada (23° 20' N; 71° 41' E) in Dasada Taluk of the district. The objectives of extension of excavation were to trace the habitation deposits of the

earliest peasant community that had lived at the site, whose extended and pot-burials were brought to light during the last two seasons; to unearth complete plans of houses in each structural phase; to locate workshops of semiprecious stone ornamental bead and shell bangle manufacturing industries; and to open more area of the settlement.

Nine 5 x 5 m trenches adjoining the earlier trenches were cut in this season. In the lowermost level of these trenches a few pits sealed by layer 4 were encountered. On of these pits yielded a large number of fragments of gold ornaments and another yielded an almost intact medium-sized pot decorated with geometric designs in black and white pigments. This pot is one of the rare survivals of the pre-Harappan levels whose burials were unearthed in the last season. The newly cut nine trenches of this season, however, did not yield any other evidence of pre-Harappan habitation.

In layer 4,3 and 2 m a number of fragmentary remains of rectangular structures were unearthed in this season. They were built of either mud-bricks of the size 32 x 16 x 8 cm, in alternate layers of headers and stretchers or rubble whose thickness varied from 64 to 68 cm. In layer 2 these rubble structures were more discernible. One of the rubble walls in this layer was Graced upto a length of 20 m in north-south direction. We are, however, not yet in a position to outline the complete plan of a house in any of the structural phase. The unearthed 20 m long wall may probably suggest that the habitation was oriented in north-south direction.

Among the important antiquities that have come to light during this season are : (i) a Harappan sealing on a clay lump complete with an inscription in Harappan script and impression of a bull below the line of inscription, (ii) an image of mother goddess embellished with steatite beads near ears, eyes, mouth and shoulders, one of the steatite beads on the left ear of the image still found *in situ,* (iii) three large copper axe heads each measuring 26 cm in length 14 cm at the cutting edge and 12 cm at the butt-end and each weighing nearly 1800 gm and a few copper bangles and rings, (iv) a steatite pendant with concentric circle designs on it and a large number of ornamental beads made of agate, amazonite, lapis lazuli, steatite and faience and fragments of shell bangles. However, the workshops of these industries at the site are yet to be traced.

HARYANA

38. EXPLORATION IN DISTRICTS BHIWANI AND HISSAR.—The Indo-French Archaeological Expedition under the joint leadership of R.S. Bisht of the Survey and H.P. Francfort of the French National Centre for Scientific Research explored the area to the south of Delhi-Fazilka National Highway in the districts of Bhiwani and Hissar of Haryana. The other members of the team were S. Jamal Hasan, Y.S. Rawat, Puran Singh, Ravinder Kumar and M.S. Rawat of the Survey and M.A. Courty, P. Gentle, C. Debaine Francfort, G. Willcox, F. Debaine and C. Pariselle of the French side. The objectives were: (i) to build up protohistoric sequence of cultures; (ii) to carry out environmental studies of the area in the past in relation to the present; and (iii) to find out artificial irrigation system, if any, of the protohistoric times.

In the course of investigation, five archaeological sites viz., Mangali 1 and 2, Rawalwas Kalan, Tigrana and Bhurtana were subjected to trial trenching while the already excavated sites of Siswal and

Mitathal were included for sampling. Besides, a gush was made between the two mounds of Mitathal to ascertain whether there existed a canal although the result was in negative. Similarly, operation at Shahpur across Firuzshah canal and at Gorchi could not prove existence of protohistoric canal.

A sitewise summary of the results follows :

Mangali 1 (29° 02' N; 75°44' E) and Mangali 2 in district Hissar are situated on low sand dunes and did not reveal any stratified deposit except a thin pottery spread on the surface and some large pits dug up for refuse or graves during protohistoric, medieval and recent times. The pre-Harappan pottery was predominantly the usual red wares classified into five fabrics, namely A, B, C, D and E, although grey ware sherds of fabric F were also present in the corpus. Painted motifs were the usual horizontal bands, hatched triangles and wavy lines done in black. Occasional use of buff pigment for filling in or highlighting motifs in black was also noticed.

Rawalwas Kalan (29° 04' N; 75° 35' E) in district Hissar, contains 3.15 m thick deposit of which about 1.25 m belongs to the pre-Harappan and the remaining to the medieval period. Of the pre-Harappan period, structural remains were represented by successive floor-levels and fire-places. In the ceramics, most of the potsherds belong to fabric 'A' and 'B'of the Kalibangan culture, while other fabrics are fewer in number. Painted motifs are simple broad bands around rim, neck or shoulder. A few sherds bearing incised designs were also noticed. Among the objects mention may be made of one fragment each of terracotta incised biconical bead, terracotta bangle, grinding stone, terracotta ball bearing pierced holes besides a few fragmentary bone points.

The site Tigrana (28° 50' N; 76° 09' E) in district Bhiwani has yielded a two metre deposit of pre-, mature and late Harappan periods. The last one was found at the eastern periphery of the main mound.

Bhurtana (28° 55' N; 76° 58' E) in district Bhiwani yielded mainly Harappan material. A few walls made of bricks of 4:2:1 ratio in respect of length, width and thickness were also noticed.

Preliminary studies of the landscape and geological formations indicated that (i) the Drishadvati was a seasonal stream on the path of progressive dessication, (ii) there was no perennial or seasonal stream near Mitathal and Tigrana and rather the area around is like a big bowl receiving the monsoon run-off, (iii) the protohistoric sites were not only confined to the banks of Drishadvati but also situated away from it but, of course, on the edge of some interdunal depression, (iv) sites like Mangali 1 and 2 might be seasonal camping sites of the protohistoric cultivators or raisers of livestock or of both. Detailed studies of the materials and samples are under way.

39. EXCAVATIONS AT BANAWALI, DISTRICT HISSAR.—R.S. Bisht of the Excavation Branch V, Vadodara, of the Survey assisted by Y.S. Rawat, Puran Singh, Ravinder Kumar and M.S. Rawat took up excavation at Banawali for final season. Fresh information has now enabled to outline a fairly coherent cultural scenario of the protohistoric Banawali. The most significant achievement was ascertaining of nearly complete conformation of the pre-Harappan as well as late Harappan settlement (fig. 1).

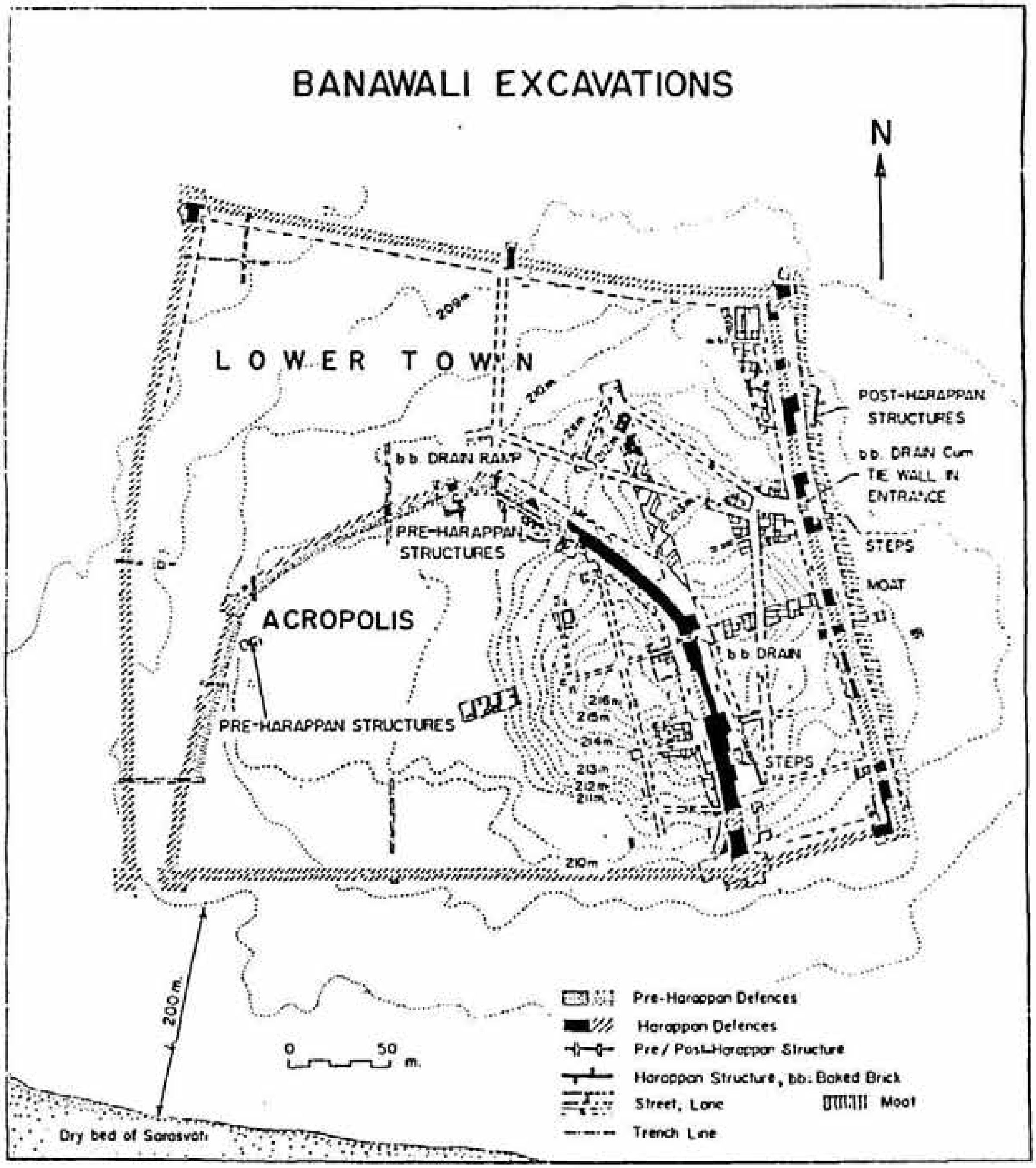

BANAWALI EXCAVATIONS
N
LOWER TOWN
ACROPOLIS
bb. DRAIN RAMP
PRE-HARAPPAN STRUCTURES
PRE-HARAPPAN STRUCTURES
POST-HARAPPAN STRUCTURES
bb. DRAIN Cum TIE WALL IN ENTRANCE
STEPS
MOAT
b b DRAIN
STEPS
200 m.
0 50 m.
Dry bed of Sarasvati
Pre-Harappan Defences
Harappan Defences
Pre / Post-Harappan Structure
Harappan Structure, bb: Baked Brick
Street, Lane
Moat
Trench Line

FIG. 1

The sequence of cultures is now as follows :

Period I : Pre-Harappan (Kalibangan) culture:

IA : Pre-defence phase.

IB : Defence phase.

IC : Transitional phase (Proto-Harappan)

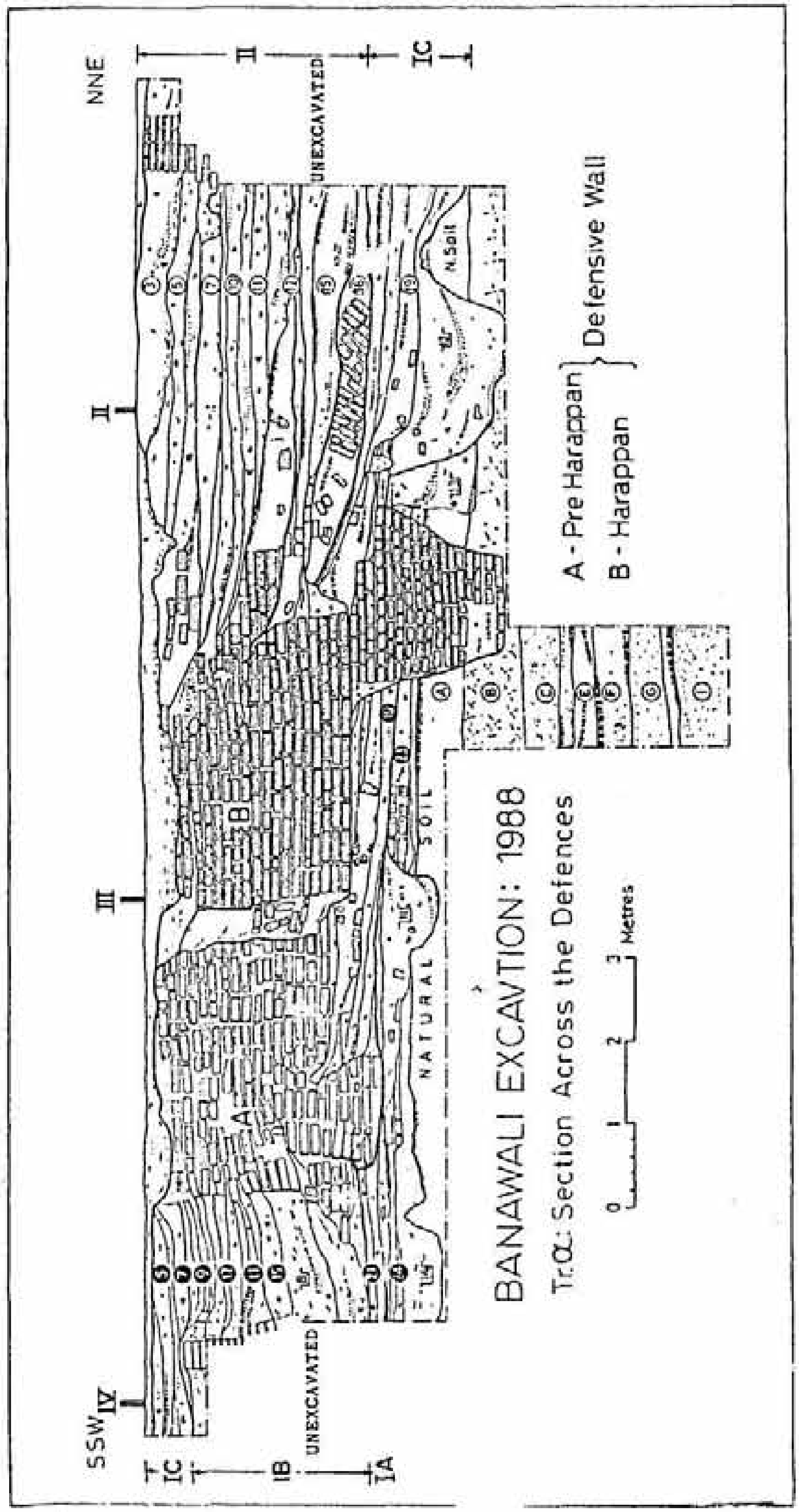
Period II : Mature Harappan culture

Period III: Post-Harappan (Banawali-Bara) culture.

As already reported earlier, the pre-Harappans initially founded at Banawali an open settlement which was subsequently secured by a wall: hence subdivision of the period into two phases, i.e., IA and IB. The average thickness of the regular habitational deposit is 2.20 m belonging to both the sub-periods.

Period IA (Pre-defence phase): The present work has settled that sub-period IA is represented by an average deposit of 0.60 m with one structural phase (pl. I) although the possibility of the second one cannot be ruled out. Comparatively, the pottery, more particularly that of fabric 'A', is finer in quality in terms of clay, baking, lightness, surface-treatment and painted motifs. Standardized moulded bricks set in mud mortar were the usual building material. The solitary fired brick-structure resting right upon the natural soil, as found in the first season's work, should necessarily belong to this sub-period.

Period IB (Defence phase): In its 1.60 m deposit were noticed two major constructional phases of defensive wall and five phases of houses (pl. II and fig. 2). Originally, the fortification wall was 1.40 m wide with no tapering on either side. Due to faulty construction, it soon started developing signs of tilting and cleavage and thus necessitating its augmentation by raising ancillary dwarf wall along the inner side. Since this measure did not seem to have withstood as it was further damaged from the outside by water-action, the Kalibangan people rebuilt it into a massive fortification wall, of which the extant width has been noticed to be 2.50 to 3.20 m because some portion of it has been chiselled out or sliced away slightly obliquely from outside by the builders of the succeeding period. However, a segment of it at one place provided the width of 3.50 m. The most significant achievement of the- season was providing of the general configuration of the fortification. While its outline from the north through west to south-west and on the south-east was determined with certainty, the southern wall along the river seems to have been washed away. At least, near the south-eastern corner, it seems to have been badly destroyed both by nature and man as the probings proved. Neither the wall nor the regular deposit of the period could be found while some deposit of Period IC was found still lying *in situ* underneath an enormous water borne debris. It is interesting to note that the defensive wall round the acropolis of Period II, which generally followed the one of Period I, looks like a horseshoe; there are, however, strong archaeological as well as topographical indications that the pre-Harappan wall was most probably designed like a large oval following the existing natural elevation. The longer axis of the settlement most probably lay from the east to west. Although at the initial stage, the pre-Harappans did not leave any space between the wall and the house inside, they


BANAWALI EXCAVTION: 1988
Tr.α: Section Across the Defences
A - Pre Harappan
B - Harappan
Defensive Wall
NNE
SSW
UNEXCAVATED
UNEXCAVATED
NATURAL SOIL
N.Soil
Metres

subsequently maintained an 1.40 m narrow street all throughout. However, the houses that ranged along the wall do not seem to be regular residential use. Rather, those might be small workshops or industrial structures in contrast to the habitational houses made with thicker walls of better masonry work.

The main building material was nicely moulded sun-dried brick of standard measurements showing a variety albeit giving the ratio of 3:2:1 in respect of length, width and thickness, which was scrupulously followed except in case of square bricks which too fall in general prescription of measurements as their sizes (already reported) reveal. In the latter case the ratio is always found to be 2:2:1.

The pottery is of the usual Kalibangan corpus in its fabrics, forms, surface treatment and painted motifs, however, almost in all first five fabrics there is a sub-group which is heavier than normal in its class and look greyish-brown in appearance. This pottery persists during the Period II and ultimately continued in Period III as well.

Among noteworthy antiquities are : two large terracotta wheels without hubs from sub-period IA and a few beads of steatite, carnelian and terracotta from sub period IB.

Period IC (Transitional, proto-Harappan phase): The previous observations regarding the cultural makeup were reconfirmed. It was again found that on all three sides the people of this phase scrupulously followed the existing fortification wall albeit by widening it almost twice as large (fig. 2). However, on the south it was found destroyed by the post-Harappans or washed away by the river flood. It was also re-established that the outer fortification which was used and rebuilt by the Mature Harappan as well was in fact conceived and constructed during this phase. By firmly determining the run of the western wall of the lower town the previous observation further showed up that the entire outer fortification was more or less irregular trapezium in outline. It was also firmly confirmed that the radial arrangement of streets of the lower division came into being due to the curvilinear nature of the antecedent fortification which was, as observed above, fully reappropriated during Period IC.

The average thickness of regular habitational deposit was found to be more or less 1-00 m. Other details and nature of finds remained the same as already reported (*1986-87,* pp. 32-34). Besides, those partially exposed (pl.III), one house located in the north-western corner of the Lower Town was laid bare completely. It consisted of seven walled spaces, of which the large one in the shape of the Roman 'T' seems to be an open courtyard furnished with fire places.

Period II (Mature Harappan Culture): It is needless to say that the Mature Harappan followed and maintained with marginal modifications at places the same planning which was laid in the preceding phase.

Most interesting is the introduction of a flight of steps rising from the Lower Town to the Acropolis near the south-eastern area of the inner fortification. On the side of the citadel, opposite to the stairway, there was found an extensive platform which is perhaps the remnant of a similar stairway for getting across the bipartite wall. The staircase of the 'lower town' is near an impressive projection which looks like an imposing bastion (pl. IV).

Outside the eastern town-wall the moat was fully exposed and found to be 5.70 m in width at the top and 3.60 m in depth (fig. 3). On present showing, this particular moat seems to be cut through

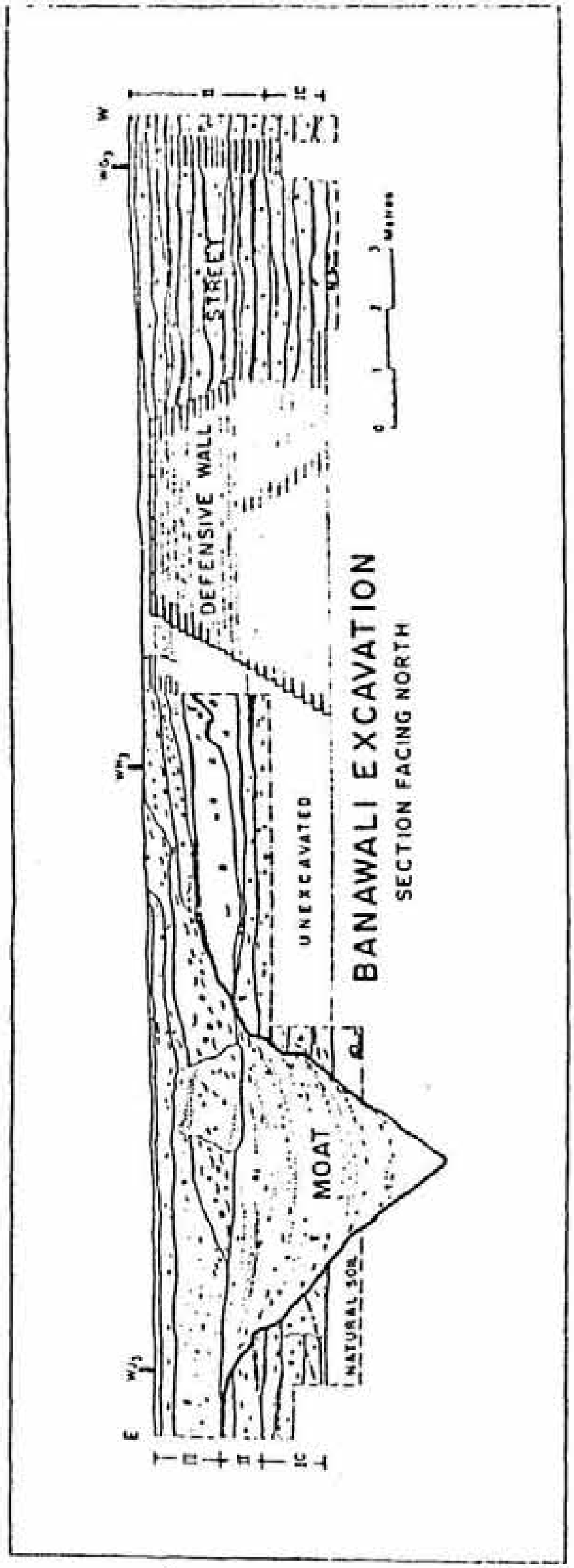

BANAWALI EXCAVATION
SECTION FACING NORTH
DEFENSIVE WALL
STREET
MOAT
UNEXCAVATED
NATURAL SOIL
E
W

FIG. 3

in the middle of this phase. Beside this moat there was found more or less equally wide but shallow channel, running parallel to it. It was perhaps meant to let off the surplus water or to feed water to the moat.

Among the two most important finds is a burnished grey ware vase decorated with two bucranian motifs in applique, one each made on diametrically opposite fields. It closely resembles, more or less, similar bovine heads occurring in painting on the pre-Harappan pots from Kot-Diji, Kalibangan, Burzahom and Sarai Khola, etc. The other is an unbaked clay figurine of an animal which has deep-cut criss-cross incisions on the back as well on one side of the neck thereby imparting it an appearance of a horse because the former might suggest the saddle and the latter the mane. Among other interesting finds are : an ivory comb (pl. V A); terracotta cakes bearing engraved human figurines (pls. V B and VI A); a terracotta cake with an engraved ass (pl. VI B); a steatite seal; and human (both male and female) figurines of clay. A tortoise shell (pl. VII A) was also recovered from the 'acropolis' area of the Indus town.

Period III (Post Harappan, Banawali-Bara Culture): Of this period 0.50 m deposit had been confirmed in previous excavation. This year only one pise wall running roughly north-south was exposed along with one circular fire-place, storage pits and working floors. In one of the floors was embedded the lower half of a small vase containing curiously a chert weight, agate beads and some non-descriptive terracotta objects and small stone pebbels (pl. VII B). A solid object having a hole in the centre across the width and four holes on the top—has been recovered of which the longer sides are curved downwards. It looks like a solid frame of a cart. Besides, two terracotta wheels with pronounced hub were also found.

In pottery, survival of pre-Harappan tradition in some of the forms and fabrics continues strongly. Besides, the pottery consisting of grey ware, handmade red ware and poor quality red ware having incised and/or pinched decoration continued to occur. The extent of the settlement of this period could not be ascertained as much of its deposit has either been eroded or destroyed by agriculturists.

40. EXPLORATION AT RAKHIGARHI, DISTRICT HISSAR.—R.S. Bisht and Y.S. Rawat discovered an extensive pre-Harappan site, locally known as Arada, situated at a distance of less than half a kilometre to the west of the Indus mound of Rakhigarhi. The site, located in village Rakhi Shahpur in district Hissar, is spread over an area of 300 m square containing a cultural deposit of about 3 m.

Besides the above, R.S. Bisht and Y.S. Rawat together with Jamal Hasan, Ravinder Kumar and M.S. Rawat examined the tube-will bore and extended it to ascertain the cultural make-up and found a 2.90 m thick deposit of the pre-Harappan culture manifested by its typical bricks and pottery. The former revealed the dimensions of 36 x 24 x 12; 42 x 28 x 14 and 45 x 30 x 15 cm, while the latter contained the fabrics A, B and C with a few sherds of D of the Kalibangan ceramics. The painted motifs were few and mostly done in black albeit with a few specimens having additional use of huffish pigment. Use of white (milk white) pigment for decoration as found in the Kalibangan ceramics has not been seen so far.

41. EXPLORATION IN DISTRICT KARNAL.—In the course of village-to-village survey, Kanwar Singh of the Chandigarh Circle of the Survey explored the following sites of archaeological interest in Panipat Tehsil:

Village/site	*Nature of remains*
Atah	Siva temple
Basegra	Ancient mound
Bhadaur	Temple
Bhanswal	Ancient mound
Brahman Majra	Siva temple
Chulkana	Modern temple and *sarai*
Dahar	Siva temple
Dehra	Well
Goela Khurd	Temple
Jattipur	Ancient mound
Jurasi	Ancient mound
Kalkha	Ancient mound
Mahrana	Ancient mound
Namunda	Ancient mound
Naultha	*Samadhi*
Patti Kalyana	Ancient mound
Rakshara	*Idgah* and well
Sanjoli	Ancient mound
Shaharmalpura	Siva temple
Sutana	Ancient mound

42. EXCAVATIONS AT THANESAR, DISTRICT KURUKSHETRA.—With a view to imparting field training to the students of the Institute of Archaeology and to investigate the nature of occupation at the site, the Institute of Archaeology of the Survey undertook excavation at Thanesar (29° 59' N; 76° 50' E) under the direction of B.M. Pande and with cooperation of J.P. Srivastava of the Excavations Branch-II, Delhi assisted by R.P. Sharma of the Institute of Archaeology, Narayan Vyas of the Bhopal Circle, G.S. Gaur, L.S. Mamani and R. Krishnaiah of the Excavation Branch-II, K.C. Nauriyal, R.K. Sehgal, I.M. Tikku, H.S. Miyan and R. Dalai of the Headquarters office, J.M. Thapar of the Chandigrah Circle, and A.K. Patel, D.N. Dimri and Rakesh Tiwari respectively of the Srinagar Circle, the Jaipur Circle and the Garden Branch, Agra.

The mound which is also called locally as the Harsh-ka-Tila measures about 900 x 500 metres and is between 15 and 23 metres in height. The mound was divided on the basis of surface features, into three parts from north to south which were designated as TSR-1, TSR-2, and TSR-3. In order to obtain optimum results, trenches were laid out in three areas on the northern, western and southern

sides. The operational area in each of the aforesaid locality measured 100 x 20 m, 10 x 10 m and 50 x 20 m.

Excavations revealed occupational deposit of about 16 metres and unfolded an almost complete cultural sequence from the Kushana to the Mughal periods. Some sherds of grey ware of the PGW lineage and having painting were also found in a limited area in one of the excavated trenches.

Barring the trench in which were found the few sherds of PGW lineage, the earliest period was marked by the use of typical Kushana red ware. Important pottery shapes included bowls with incurved rim, sprinklers, vases with long vertical neck, basins, etc. In the upper levels, this pottery was found associated with moulded, bright red-slipped and red polished pottery. No structures could be located due to the limited excavated area in which remains of this period were found. A trench on the northern slope containing redeposited strata also yielded Kushana material. The antiquities of this period include a terracotta sealing with Brahmi inscription in first-second century characters reading '*Sri Rudrah*' (pl. VIII A), antimony rod, terracotta votive tank and terracotta plaque (pl. VIII B).

Of particular interest are terracotta flat tablets (pl. IX A) of either square, rectangular or parallelogrammatic shape having in majority of cases three vertical/horizontal/oblique or semi-circular and in a few cases two lines scratched on one face which were found in large number from one of the trenches on the lower slopes of the mound on the north-west. The exact stratigraphical position of these tablets which have been reported in Kushana levels from several sites elsewhere is not clear and needs to be clearly understood. However, it seems that these were found in association with pottery which on present showing is post-Kushana.

The next was the Gupta period (*circa* fourth to middle of sixth century) marked mainly by moulded pottery, red polished ware and plain red ware with shapes typical of the period. Other important objects included a fragmentary Vishnu image and Brahmanical deities, terracotta plaque, a small mould for casting human head (pl. IX B) and some moulded bricks.

The Pushyabhuti or Vardhana period (middle of the sixth to end of seventh century) was distinguished by a massive brick building and other structural remains. One of the walls of this massive structure was excavated upto ninety-nine courses, without reaching the bottommost course. This building was evidently of substantial size.

The pottery of this period generally bears chocolate brown slip and impressed decorative motifs such as the leaf, the sun, flowers with petals, criss-cross designs, etc. Amongst notable finds of this period, mention may be made of a highly fragmentary stone inscription in seventh century characters (pl. X A), a stone torso of Kubera, a terracotta elephant, beads of semiprecious stones and terracotta and ivory bangles.

The Rajput period (*circa* eighth to twelfth century) which includes the Pratiharas and the Tomaras was represented by distinct red ware industry and three structural phases of building activity. The stamped decoration on pottery included concentric circles, floral designs and mat impressions. Knife-edged bowls, spouted vessels, variety of lids and jars were main pot types. Scanty evidence of glazed ware was noticed in upper levels. Miscellaneous objects of daily use such as terracotta human and animal figurines, stone pestles, iron nails, a bronze (?) vase (pl. X B) and beads of semiprecious stones were also found.

The Sultanate period (thirteenth century to first quarter of sixteenth century) was marked by a sturdy red ware and glazed wares. Brick walls of residential buildings were exposed. Evidence of some kind of conflagration towards the end of this period was noticed in TSR-3 by way of substantial deposits of ash, etc.

The Mughal period (second quarter of sixteenth to mid-nineteenth century) was represented by remains of large house-complexes (pl. XI A), a hall-like building, a massive arched structure (pl. XI B), entrance staircases, brick-built entrance with off-set projections, covered and open drains some of which were lime-plastered, brick-on-edge floors, etc. In one of the trenches, close to the hall-like building, a series of shallow pottery basins in a row was exposed. The hall-like building, measuring 1015 x 8.50 m the roof of which was resting on brick-built square-based pillars, had inside it fair quantity of slag, ash, loose greyish earth, *tandoor*-like oven, *kuthala* or storage jar, and seems to be some kind of smithy or workshop. The exposed houses comprised rooms of various sizes, bathrooms and kitchen with earthenware utensils, pestles and grinders, *chulhas* and other refuse material. The houses were built along streets with lanes and bylanes. A partly-exposed house in TSR-1 opened into a 2.40 m wide paved street.

Ceramic evidence included fine Mughal wares, both plain and decorated (pl. XII), glazed ware, grey ware, stone ware and sherds of Chinese porcelain (pl. XIII A) some of which contain inscriptions in Chinese characters. The main pottery shapes of this period include plates, *handis, karahis, huqqas, chilams, surahis,* bottles, variety of lids with heavy central knob and lamps.

Important antiquities included human and animal figurines (pl. XIV), balls, beads, dice, cartframe, rings, ear ornaments, dabbers, gamesmen and rattle of terracotta; bangles and rings (both plain and decorated) and ear ornaments of ivory; spearheads, arrowheads, spades, clamps, nails, knives of iron; beads, human figures, balls, pestles and saddle-querns of stone; shell bangles and ring; points and decorated pieces of bone; a gold nose ring; several copper coins, one of which is of Shah Alam II (1759-1806) issued from the Delhi mint; a signet ring with an inscription in Persian and a partly-broken terracotta seal (pl. XIII B) with inscription on both faces which reads: *"Khadim-i-Shar lbn Muhammad Qaziyan Qazi Muhammad Fazil"* on one face and *"Nur Muhammad Ahmad Shaikh lbn"* on the other.

A few human burials were found in some trenches both in TSR-1 and TSR-3. The burials were mainly oriented north-south and in few cases, the graves had been cut into the walls of earlier structures.

The brick-built defence wall, the existence of which was observed on the surface particularly on the northern and western sides of the mound, was exposed at several places. The wall is of about 4 m average width with a bastion on the north-western corner (pl. XV A) and a small bastion on the north (pl. XV B). There were several sub-phases of construction beginning with the Sultanate period. At some places, the fortification wall appears to have been raised by providing box-like structures filled with all kinds of material available at the site. One constructional phase of defence wall exposed on the southern slope is of an early date. On the present showing, it appears that the defence wall was introduced (at Thanesar) perhaps after the Gupta period and raised subsequently in following

successive periods. The fortifications seem to have fallen into disuse sometime in the late Mughal period as is evident from the fact that structures have been found raised over it.

JAMMU AND KASHMIR

43. SCIENTIFIC CLEARANCE OF TISSERU STUPA, DISTRICT LEH (LADAKH).—In continuation of the previous year's work (*1986-87,* pp. 36-37) the Srinagar Circle of the Survey under the direction of R.C. Aggarwal, assisted by R.S. Fonia, A.K. Pandey, Vijay Shankar, A.K. Patel, Balbir Singh Jamwal and Tsering Wangchuk, took up scientific clearance of Tisseru Stupa mainly, to expose its different structural parts on the remaining southern and western side.

This year's work exposed the lower and upper circular terrace of the stupa. The terrace walls are like the walls of the northern and eastern side having inward rise and built of rubble stone masonry in mud mortar. There are remnants of plaster over them. Paws of lion figurine on the southern and western side, a damaged figurine of lion and floral design in stucco have also been exposed on the upper circular terrace. Both the terraces are badly damaged in the centre on the western and the eastern sides.

Over the upper circular terrace is built a structure having four built-in walls in ascending order with provision of ambulatory passage in-between them. Only its outermost wall has been provided with buttress wall. The lower portion of the wall is of rubble stone masonry whereas the upper portion is of sun-dried bricks (10 x 20 x 40 cm). All the passages on the southern side are interconnected through entrances in the centre of the walls. An entrance in the fourth wall which is an access to the drum portion appears to have been closed in the later stage. The floor and ceiling of these passages were made of wooden twigs as evident in the second and third passages on the southern side. Passages on the western side are badly damaged.

Above the walled structure rests the drum of the stupa. It has radiating walls of stone and brick masonry around it which act as buttresses to the topmost walled structure. The drum comprises vaults on its periphery.

A hoard of clay tablets depicting Sakyamuni Buddha, Manjusri, Tara, Mahakala, Samvara and *chorten* have been found from the site.

44. EXPLORATION IN DISTRICT PUNCH.—In the course of exploration, R.C. Aggarwal and S.N. Kesarwani of the Srinagar Circle of the Survey discovered the following sites on the banks of the river Punch and its tributaries :

Taluk	*Village/Site*	*Nature of remains*
Mande (Haveli)	Chak Katro (33° 45'30" N; 74° 11'20" E)	Early and late medieval pottery
-do-	Chandak (33° 45' 20" N; 74° 10' 15" E)	Kushana pottery, remains of early medieval temple and late medieval well

Taluk	*VillagelSite*	*Nature of remains*
Mande (Haveli)	Mandi (33° 47' 40" N; 74° 15' 20" E)	Devanagri inscription, Kushana and medieval pottery
-do-	Salum (33° 48'N; 74° 13' E)	Late medieval sculpture and pottery
-do-	Satra (33° 46' 30" N; 74° 12' 20" E)	Early and late medieval pottery
-do-	Sauji (33° 52' 20" N; 74° 17' 10" E)	Kushana pottery ad memorial stone of late medieval period
-do-	Sekhlu (33° 47' 10" N; 74° 14" E)	Late medieyal *baoli* with sculptures
Punch	Ajot (33° 46' 20" N; 74° 4' E)	Kushana and early medieval site
-do-	Gulpur . (33° 46'N; 74° 3'E)	Kushana pottery and structure
-do-	Old Punch (33° 46' N; 74° 5' 46" E)	Kushana pottery, remains of early medieval temple and sculptures, late medieval fortress

43. EXPLORATION IN DISTRICT RAJAORI.—In the course of exploration in the district, S.N. Kesarwani under the supervision of R.C. Aggarwal of the Srinagar Circle of the Survey, discovered the following sites of archaeological interest:

Taluk	*Village/Site*	*Nature of remains*
Kalakot	Deolian (Bhandar) (33° 10' 30" N; 74° 23' 25" E)	Late medieval fortress, tank and *baoli* with sculptures
-do-N	Panjnara (33° 11'40" N; 74° 21'45" E)	Early medieval temple complex
aoshera	Darhal (33° 13' 30" N; 74° 8' 40 " E)	Late medieval fortress
-do-	Rajil (33° 09' 30" N; 74° 10' E)	Early medieval pottery and about 150 years old mosque Late medieval
-do-Sun	Richua (Chingas) (33° 15' N; 74° 15' 20" E)	temples
darbain	Gandhe (33° 30" N; 74° 27" E)	Remains of early medieval temple and sculpture and late medieval sculptures

KARNATAKA

46. EXPLORATION IN DISTRICT BELLARY.—During the course of village-to-village survey, W.V.S. Narasimham of the Bangalore Circle of the Survey recorded the following antiquarian remains.

Taluk	*Village/Site*	*Nature of remains*
Sandur	Anthapura	Siva temple (*circa* seventeenth century), hero-stones, inscriptions
-do-	Appalapura	Microliths
-do-	Avinamadugu	Medieval sculptures and fortification
-do-	Ayyanahalli	Microliths
-do-	Basapuram	Medieval temple and inscriptions
-do-	Bennihatti	Palm-leaf manuscript
-do-	Chikkantapuram	Hero-stones, one being inscribed
-do-	Daroji	Parallel-sided blades, pecked and ground stone tools, medieval temple and sculptures
-do-	Ingaligi	Ash mound
-do-	Joga	Medieval temple
-do-	(Kere) Rampura	Microliths
-do-	Kodalu	Microliths and memorial stones
-do-	Kurikuppi	Microliths, temple (*circa* sixteenth century) and medieval sculptures
-do-	Lingadahalli	Copper coin
-do-	Malapuram	Microliths
-do-	Mallapuram	Handaxes (?), hero-stones
-do-	Nagalapuram	Inscriptions, memorial-stones and medieval sculptures
-do-	Rajapuram	Handaxes (?), microliths, fragmentary pecked and polished axe, neolithic pottery and rock paintings
-do-	Santanapuram	Hero-stone and *Idgah*
-do-	Talura	Temples, hero-stone and medieval fortification
-do-	Thoranagal	Microliths, disturbed ash mound, mounds yielding neolithic and early historic pottery
-do-	Tumati	Hero-stones and inscriptions
-do-	Ubbalagandi	Inscriptions
-do-	Vaddu	Medieval temple
-do-	VittalaDura	Hero-stones

47. EXCAVATION AT HAMPI, DISTRICT BELLARY.—In continuation of last year's work (*1986-87,* pp. 38-40), the Hampi National Project of the Survey under the direction of B. Narasimhaiah, assisted by

K. Veerabhadra Rao, HanumanthappaTelagu, M. Loganathan, T.P. Balakrishna Unnithan, J. Ranganath and V.N. Joshi, resumed excavation in the Royal Enclosure as well as Hazara Rama Complex with the objectives of completely combing the areas of any possible structures as the above areas formed the nucleus of the Vijayanagara City, and simultaneously conserving the excavated remains.

Excavation carried out near the southern doorway of the Hazara Rama temple at the northern end of the passage (pl. XVI) revealed three rooms built of rubble in mud mortar across the passage. The walls running in east-west orientation over the disturbed eastern cyclopean wall of the passage obviously belong to a later period when the passage fell into disuse. The excavation also exposed architectural details of the southern doorway such as the upper portion of the niche containing the canopy portion of the figure of Vitthala besides the dressed granite slabs of the wall. The stone channel exposed earlier, running into the temple through the entrance bifurcates after entering the temple. One of the arms runs towards east and the other towards north. The eastward running channel empties into a storage well in the south-eastern corner of the temple, whereas the other feeds another storage well behind the temple. This channel traverses further behind the northern compound wall of the temple. Interestingly, as the channel is connected to the well (2.10 m square and 6.45 m deep) once it is filled up, water automatically flows further north. The excavation also yielded the stone merlon blocks originally fixed atop the compound wall but later employed for lining the eastward running channel in the temple.

Excavation conducted in an area of 530 sq.m at the southern extremity of the passage leading from Hazara Rama southern doorway and outside the south-west corner of the Royal Enclosure indicated that the above channel also feeds a stepped tank cut into the bedrock and lined with dressed stones on the western side of Royal Enclosure, which was exposed earlier. At the southern extremity (near the main road leading to Hampi) a platform, having north-south orientation of which only three courses are extant, was also exposed. This was perhaps supporting a *mandapa* guarding the entrance to regulate the entry of persons into the Royal Enclosure through its western doorway.

Digging in the area north-east of the Mahanavami Dibba, to ascertain the relationship of the walls found on the surface with the Mahanavami Dibba, laid bare a screen wall running parallel to the northern retaining wall of the Mahanavami Dibba. The extant wall built of huge granite blocks set in dry masonry is only one course high at places and is much disturbed. A two metre square and 3 m deep soakage pit was also exposed in the north-eastern corner of the Enclosure. A stone sill with iron bearings on either side, which once supported the stone door (pl. XVII A) is a significant find. Fragments of the missing door were also found here. These massive stone doors, which are replicas of contemporary wooden models, were employed to close the entrance (pl. XVII B). The decoration and the amount of effort involved in raising such a huge door-frame suggest that this entrance was used mainly by the royal family and other feudatories for going to Mahanavami Dibba. This view is also supported by the fact that the north-east corner of the enclosure nearer the soakage pit is plastered with lime, which was probably used for cleaning hands and feet before entering the enclosure. The flagstones exposed along the retaining wall of the Mahanavami Dibba indicate that the enclosure was paved with flat stones.

Further excavation on the southern side of the public bath by way of clearance of debris comprising loose grey earth mixed with potsherds and architectural fragments brought to light the outlet of the public bath, the outer extent of which is yet to be traced. The main drain, which was exposed earlier, was found to run towards south after crossing the screen wall. Roughly parallel to the southern retaining wall of the public bath, another rubble wall; probably raised to give it additional support, was also traced. The public bath had an earlier outlet for depletion but was abandoned when the new outlet was incorporated into it subsequently. A small shallow square stepped well was also exposed immediately south of the public bath. The seepage water collects into a 2 m deep pit in the north-western corner. The three squatting lions originally placed at the centre of each side of the tank of the four pillars, which probably supported a kind of balcony overhanging the tank, were also retrieved. Trenches laid on the eastern side of the tank revealed that the retaining wall had collapsed and the earth cleared off the tank was dumped here. Excavation here also yielded two more pieces of squatting lions.

Excavation in the Hazara Rama complex to fully expose the structures lying on either side of the Peddangadi Veedi (Big-Market Street), by which name the Hazara Rama bazar was popular, brought to light the western compound wall of temple no. 1 exposed earlier. A cyclopean wall built of roughly dressed, wedge-shaped blocks, having a steep, plain outer surface and very steep steps on the inner face was also traced. This wall which connects the gateway north of Hazara Rama temple and the arched entrance east of Hazara Rama temple separates the temple complex consisting of temple no. 1, the dilapidated structures to its east, the square tank, the *mandapa* and the monolithic Garuda pillar from the eastern area. The extant height of the wall is 2.95 m and 1.15 m wide at the top. At a depth of 2 m a stone flooring around a square pit of 1.70 m square was encountered. This pit was lined inside with a masonry wall on the four sides and at the mouth it was narrowed down to only 1 m square by corbelling roughly dressed slabs. There are two slabs across the mouth covering almost half of the opening. The working level of the pit is well above the working level of the cyclopean wall on its east almost abutting it. Originally meant to be a wall, it appears to have been used later as a silo.

The compound wall of temple no. 1 was also traced on the eastern side. Extant to a height of 1.75 m, comprising of five courses of roughly dressed granite slabs, the width of this wall varies from 0.90 m to 1.10 m. Each course has some slabs laid across, meeting both the faces like headers for strong binding. The core of the wall was filled up with rammed earth. A stone trough with two holes was found in the south-western corner of the temple. In front of the temple many stones, worn out on one side were found, indicating that they were once part of the road known from inscriptions as Peddangadi Veedi.

Near the arched gateway of the Peddangadi Veedi, a storage tank with an inlet on the southern side was found north of the entrance after clearing the accumulated debris. It was built against the enclosure wall on its western side and is plastered with lime plaster. The bottom was also plastered with lime after giving firm rubble soling. The beams above were laid to facilitate drawing of water from the tank. Excavation here revealed a number of architectural fragments probably belonging to the cloister running in east-west orientation, remnants of which can be seen in the area north-west of the arched gateway.

Excavation on the southern side of the road joining the Hazara Rama temple and the arched entrance have brought to light rectangular (15 m x 12 m) stepped-tank. This tank, built of roughly dressed granite slabs, has steps on three sides except on west and has two small landings of 1.05 m width before reaching the water edge. Fed by a stone channel on its western side, it has a catwalk all around with the outer edge marked by a *kakshasana*-like raised course of stones. The tank was subsequently deepened and converted into a stepped well. While deepening the tank rough steps were cut in the bedrock besides providing a ramp on its south-eastern corner probably for some religious ceremony.

The antiquities found during the excavation include objects of gold, silver, copper, brass and iron, bone and ivory, stone miniatures and Siva-*lingas* besides a variety of beads including that of pearl. Copper coins, an iron mortar (pl. XVIII A), a miniature gold pot and a miniature Siva-*linga* with a brace are amongst the noteworthy antiquities. The iron mortar measuring 0.61 m long has diameter of 0.12 m at the muzzle end and 0.10 m at the rear end. The diameter of the bore is 0.05 m at the muzzle end. It has a small hole near the narrow side 0.04 m from the end. Unlike the specimen discovered earlier this does not have the pivots for turning it along the vertical plane. Though it is rusted on the surface the overall shape is intact. The gold miniature pot (pl. XVIIIB), 1.4 m high, was made in four pieces and then soldered. It has provision for the lid. The exact purpose of this miniature pot is not known.

The head of Garuda (pl. XIX A) and the copper coins were also found in the tank. Though many miniature Siva-*lingas* were found in the past, its method of use in religious activities was not known. A lone specimen unearthed in this season has given a clue to its use. The miniature Siva-*linga* with a copper brace and rings on either side was worn by passing a string through the rings, (pl. XVIIIC). It is more probable that they must have attached it to the *yajnopavita.* The panel with intricate carvings of the Later Chalukyan period found in the Hazara Rama passage is another interesting find (pl. XIX B).

The gold chain (pl. XX A) weighing nearly 44 grams found in a soakage pit north-west of Mahanavami Dibba outside the enclosure in a noteworthy specimen. It consists of roughly square links of 1 mm diameter soldered is such a way that the open ends of the two are perpendicular to each other and become a single unit in the chain. Interestingly, similar chain decoration is also found on a sculpture of a royal person. Another important find is a gold *thali* recovered from the stepped tank near the Hazara Rama Complex. It is 9 mm in diameter with the figure of Lakshmi seated on a lotus in repousse. Incidentally, the ring for the thread is also fabricated from the same sheet and soldered for strength.

The pottery unearthed includes vases, dishes, shallow plates, vessels and a number of miniature pots of medium to fine fabric with or without a black slip. Some of them bear pre-firing decorations. Fragments of cream coloured Chinese ware with blue paintings were also found. A fragment of the bottom portion of a dish (pl. XX B) contains four letters in Chinese characters representing symbols of long life, riches, growth, intelligence, etc., normally found on the 'deluxe ware'.

The Department of Archaeology and Museums, Karnataka State continued excavations in the Nobleman's Palace area and the area north of Hazara Rama temple at Hampi, under the direction of M.S. Nagaraja Rao.

Nobleman's Palace no. 11, Nobleman's Palace no. 14 and Temple no. 2 were excavated in the Nobleman's Palace area. Nobleman's Palace no. 11 is situated to the west of Nobleman's Palace no. 1. This structure, facing east, has an open courtyard in front which is surrounded by an enclosure wall. The main structure has three ascending levels. On the north and south of the main structure are small rooms. Iron nails, clay beads, bangle pieces, ivory dice, tooth cleaners, soapstone pencils, decorative female figure of lead and Siva-*lingas* were found in the excavations. Out of these the tiny figure of lead representing a. decorative lady standing on a lotus, flanked by *hamsas* on either side is an interesting feature.

Nobleman's Palace no. 14, facing east, lies to the north-east of Nobleman's Palace no. 12. Like other structures in this complex, this structure also has several landings. This structure consists of an openyard with enclosure wall. A flight of steps leads into the first landing from the openyard. Here on either side are rooms at a higher level on the second landing. A flight of two steps in the northwest corner leads to the second landing. At the centre of the second landing is a raised platform. Several iron pegs, nails, rings, stone pencils, glass bangle pieces and small Siva-*lingas* were recovered in the excavations.

Temple no. 2, located to the north-west of Nobleman's Palace no. 1, is facing east. This is a small temple consisting of *garbhagriha* and *mukhamandapa.* To the north of the temple is a small well. There are small rooms to the west of the temple. Sculptures of Hanuman and Alvar, a tiny image of Venugopala and thin broken sheets of gold used for decoration have been found in the course of excavation.

Structure no. 1 (24.50 m x 9.70 m) to the north of Hazara Rama temple faces east. At the centre of the structure are two parallel walls running in north-south direction. Across these walls at the centre at a higher level is a thin wall running in east-west direction. In between the parallel walls is rammed earthen floor. Iron nails, chain, glass bangle pieces, brass bell have been found in the excavations.

48. EXCAVATION AT SANNATI, DISTRICT GULBARGA.— In continuation of the previous season's work (*1986-87,* pp. 41-42) A.P. Sagar and D. Hanumantha Rao, assisted by R.S. Kulkarni, J. Vara Prasada Rao, T.C. Ratnam, A. Suresh, Ananda Tirtha, S.C. Edwin and H:C. Thapliyal, of the Survey in collaboration with the Society for South Asian Studies, U.K., represented by James Howell, assisted by Annie Howell, carried out excavation of the second Stupa mound at three major areas viz., Central Sectional Cutting; Deep Transectional Cutting; and Peripheral Excavations.

1. *Central sectional cutting:* With an intention to find out the structural details of the stupa at the centre, an area measuring six metres square was taken up and dug to the natural bedrock. The excavation revealed that the mound was made up of a series of successive dumps of mud and shale and mixed deposits of both, with occasional potsherds and small brickbats. This has also given us a deep section of the mound having 9.50 m depth, a circular pit measuring 1.50 m diameter cut into the shale deposit, having 0.30 m depth, filled with brown clay is found. Again, at 2.40 m depth a deposit of lime spread was noticed, with no structural association but has yielded some carbonized seeds (yet to be identified) and a small quantity of charcoal. At the bottom, a small pit cut into the natural rock, filled with black clay earth was also met with.

2. Deep transectional cutting: The transectional cutting from the centre to the northern end of the mound of previous season, was continued by reducing its width to 2 m with an intention to have a longitudinal section across the mound to know the structural details and to correlate with the peripheral structural activities with the mound. This was cut down to the level of undisturbed black cotton soil on which the stupa was built. It also revealed that at the peripheral end of the drum a semicircular foundational pit was cut into the undisturbed black soil, and the drum wall was built.

3. *Peripheral Excavation:* This has covered the entire southern half of the mound and brought to light the outline of the stupa, a brick platform and large-scale pit activity.

(a) In this area inspite of constant ploughing and large-scale pit activity, the extent of the stupa was quite clear. It is circular on plan. The retaining wall of the drum is built of shale blocks as in the northern half but most of the shale blocks have disintegrated.

(b) The brick platform is built abutting the stupa drum, its northern wing is actually resting on the top of the drum wall. The southern wing is yet to be exposed. On the east-west, the width of the platform measures 19 m. The platform core is filled with courses of slate rock regularly laid one above the other. At the exterior of the eastern and western sides the brick walls are decorated with mouldings at basal region. It is provided with an approach from the west through a small platform ascended from north by a flight of two limestone steps having a moonstone at the base and a guard-stone at its western side. The bricks measuring 50 x 25 x 7 cm used for its construction tally with those used in the drum wall rebuilt on the northern side, which belongs to the II phase of the stupa construction.

(c) The excavation on either side of the platform revealed a large-scale disturbance of cultural strata by way of digging of pits of irregular shape, made stratigraphically at a much later period. This may relate to the destruction phase of the site. One such pit in the south-west corner of the site has yielded a memorial pillar, broken into two pieces. One of these contains sculptures depicted in two tiers with a label inscription engraved in between, in early Brahmi characters datable to second century AD (pl. XX C).

Besides antiquities like beads, pottery, iron and copper objects, the above excavation has yielded seventeen lead coins, and four copper coins, mostly ascribable to Satavahana dynasty. Most of the coins bear on the obverse a crescented three-arched hill with a legend and on the reverse the Ujjain symbol.

49. EXPLORATION IN DISTRICT KOLAR.—During the course of his exploration, P.S. Sriraman of the Bangalore Circle of the Survey brought to light the following sites:

Taluk	*Village/Site*	*Nature of remains*
Mulbagal	Avani	Habitation mound (100m x 50 m) with cultural remains from Megalithic period, group of temples (*circa* tenth to seventeenth century), inscriptions, hero-stones and sculptures

Taluk	*Village/Site*	*Nature of remains*
Mulbagal	Balla	Inscribed hero-stones Ruined
-do-	Chitteri	Saptamatrika temple and inscribed hero-stones (*circa* tenth century)
-do-	Cholangunte	Inscriptions (*circa* sixteenth century)
-do-	Gottikunte	Group of hero-stones, one bearing a Tamil inscription of *circa* thirteenth century.
-do-	Idlapura	Habitation mound (70 m x 70 m) of medieval period
-do-	Jogalkashti Kilu	Group of memorial stones and inscriptions of medieval period Megalithic
-do-	Holali	burial site of cist with stone circle type Inscribed hero-stones (*circa* tenth century)
-do-	Kondenahalli Agrahara	Group of hero-stones Habitation
-do-	Kuppampalya	site (100 m x 100 m) with early
-do-	Mel Gani	medieval cultural assemblage, inscriptions, Saptamatrika temple and inscribed hero-stone (*circa* tenth century) Hero-stones and sculptures of *matrikas*
-do-	Padakashti	Inscribed memorial stone (*circa* tenth
-do-	Rampura	century Memorial stone of medieval period
-do-	Sringere Chadamanahalli	

50. EXPLORATION IN DISTRICT SHIMOGA.—During the course of exploration, C.S. Seshadri of the Bangalore Circle of the Survey noticed the following antiquarian remains.

Taluk	*Village/Site*	*Nature of remains*
Shikaripur	Agrahara Muchadi Ambar	Sculptures of Later Chalukyan style
-do-	Koppa	*Sati* stones
-do-	Arsinagere	Sculptures and inscriptions (seventeenth century)
-do-	Basavanandihalli	Temple (sixteenth-seventeenth century)
-do-	Bhogi	Inscriptions (ninth century) and inscribed hero-stones (twelfth century)

Taluk	*Village/Site*	*Nature of remains*
Shikaripur	Bisalahalli	Inscribed hero-stones (twelfth century)
-do-	Chikka Jambur	Medieval fort
-do-	Chikka Magadi	Inscriptions, Brahmanical and Jaina tem-ples of Hoysala style Temples,
-do-	Churchugundi	sculptures, hero-stones (sixteenth-seventeenth century)
-do-	Donanagudde	Medieval sculptures Sculptures
-do-	Elagere	of Hoysala school Inscribed hero-stone
-do-	Haraguvalli	Sculptures of Post-Vijayanagara style
-do-	Hire Kalvatti	Inscriptions and hero-stones
-do-	Hire Jambur	(tenth-eleventh century) Inscribed hero-stones of Hoysala period
-do-	Hitla	Brick structures of early historical pe-riod, inscription (ninth-tenth century),
-do-	Isur	Later Chalukyan apsidal temple and in-scribed hero-stones Inscriptions and medieval fortification Inscriptions,
-do-	Kadenandihalli	hero-stones and *sati* stones Medieval
-do-	Kalmane	iron working site Sculptures of
-do-	Kaniya	Nayaka period Inscriptions
-do-	Karnehalli	Inscriptions (fifteenth-sixteenth century)
-do-	Kortigere	Inscriptions of Satavahanas, Kadambas,
-do-	Kuskur	inscribed hero-stones and sculptures
-do-	Malavalli	(twelfth-thirteenth century) Brick structures of early historical period, inscriptions of Kirtivarma (AD 647-677)
-do-	Mallenahalli	of Chalukyas of Badami and hero-stones Inscription Inscriptions and sculptures of Hoysala
-do-	Manchi Koppa	school
-do-	Mayathammana	Inscribed hero-stone (twelfth century)
	Muchadi	Hero-stones (ninth to thirteenth century)
-do-	Muthagi	Sculptures of Hoysala school
-do-	Muthalli	Hero-stones of Hoysala period
-do-	Narasapura	Medieval fortification Medieval
-do-	Negalige	sculptures
-do-	Ragi Koppa	
-do-	Sanda	

Taluk	*Village/Site*	*Nature of remains*
Shikaripur	Seelvantana Koppa	Medieval temples and hero-stones
-do-	Serihalli	Inscriptions and hero-stones of Hoysala period
-do-	Settihalli	Inscription
-do-	Shankari-Koppa	Sculptures (twelfth century)
-do-	Shivanapada	Medieval inscriptions
-do-	Tadasanahalli	Inscribed hero-stones and sari-stones of the Later Chalukyan period.

MADHYA PRADESH

51. EXPLORATION IN DISTRICT BASTAR.—J.K. Patnaik, S.K. Ganguly, K. Srimani of the Bhubaneswar Circle of the Survey explored 26 villages in Bhopalpatnam Tehsil in course of the exploration work of the area under the submergence of the Indra-Sagar Hydel Project. The villages/sites with antiquarian remains are listed below:

Village/Site	*River/Nala*	*Nature of remains*
Badekakler (19°05'N;80°30'E)	Dobri Nala	Memorial granite pillars
Dhvdme (19° 21'N; 80° 33'E)	Indravati river	Tribal memorial pillars
Edapalli (19° 10'N; 80°27'E)	—	Memorial pillar
Netikakler (19° 17'N; 80° 31'E)	—	Memorial pillar
Pasewada (19° 16' N; 80°28'E)	Indravati river	Ruins of a medieval Siva temple facing east consisting of a sanctum, vestibule, porch and an entrance porch and flat ceiling
Phulgundam (19° 5'N; 80° 29'E)	Dobri Nala	Memorial pillars of late period

52 EXPLORATION IN DISTRICT DATIA.— In the course of village-to-village survey, R.K. Chaturvedi assisted by Rakesh Verma of the Department of Archaeology and Museums, Government of Madhya Pradesh, carried out exploration in the District and reported the discovery of the following sites:

Village/Site	*Nature of remains*
Agora	Early historical, sculptures
Akola	Sculpture
Amara	Sculpture
Aser	Fragmentary sculpture
Badokhari	Sculpture
Badonikhurd	Early historical, inscriptions, sculptures, medieval pottery
Baghawati	Sculpture
Banapura	Fragmentary sculpture, medieval pottery
Barjorpura	Broken sculpture
Barkheda	Early historical
Basai	NBP, sculptures
Baswaha	Early historical
Berachha	Early historical, NBP, fort
Bhadhawali	Early historical
Bhadumar?	Fragmentary sculptures
Bharoli	Early historical, *garhi,* sculptures
Bhitora	Fragmentary sculptures
Bhowai Buruga	Broken sculptures
Bohora-ka-bagh	Early historical, sculptures
Bijania	Siva-*linga*
Budhara	Fragmentaary sculptures
Buhara	Medieval pottery, sculptures
Chak Chandeva	*Baoli*
Cheema	Early historical, coins
Chirole	Medieval pottery
Chopara	Early historical, sculptures
Damani	Broken sculptures
Devgarh	Medieval pottery
Devapura	Medieval Pottery
Dhanoli	Early historical, sculputures
Dhirpur	Early historical, sculptures
Diguwan	Sculptures
Dohar	Microliths, Black-and-red ware, PGW, NBP, early historical, sculptures
Dongarpur	Medieval pottery
Ekara	Sculptures

Village/Site	*Nature of remains*
Erai	Early historical, sculptures
Ghughari	Medieval pottery
Govind Nagar	Medieval pottery
Gyara	Medieval *garhi,* broken sculptures
Hatlab	Early historical, sculptures
Hindora	Early historical, NBP, sculptures
Hinetia	Early historical, NBP, sculptures
Jaswantpur	Medieval pottery
Jatpur	Medieval pottery
Joharia	Early historical, sculptures
Kadhari	Fragmentary sculptures
Kasali	Early historical, inscriptions
Keolari	Medieval pottery
Khadaua	*Baoli*
Khaikheda	Early historical
Kheronghat	Early historical
Kheri	Sculptures
Khiris Ghoghi	Sculptures
Khodan	Medieval tank and *garhi*
Kua Khera	Early historical, NBP
Kurthara	Early historical, sculputre
Kusoli	Sculptures
Lanch	Early historical, *garhi,* Siva-*linga,* sculptures
Magron	Sculptures
Meheba	Siva-*linga*
Mahroli	Early historical
Makdari	Broken sculptures
Makoli	Sculptures
Mewali	Fragmentary sculpture
Mudara	Sculptures
Nirawal	Broken sculptures
Panehargarh	Medieval sculpture
Parasara	Medieval temple
Pathora	Sculptures
Ramgraha	Fragmentary sculptures
Rampura	Sculptures
Raniapura	Medieval pottery
Rarua Jivan	Sculptures

Village/Site	*Nature of remains*
Rarua Rai	Early historical, sculptures
Ratai Kheda	Early historical
Sahera	Fragmentary sculptures
Satlab	Early historical, sculptures
Satlon	Sculptures
Seonda	Palaeolithic tools, early historical, sculptures
Setama	Fragmentary sculptures
Sewani	Sculptures
Sikri	Sculptures
Sirasa	*Baoli*
Sunar	Sculptures
Targuwar	Sculptures
Tharet	Early historical, sculptures
Tigharu	Sculptures
Uchad	Early historical, NBP, sculptures
Unnao	Early historical, NBP, medieval pottery, sculptures
Urdana	Sculptures
Veekar	Early historical, NBP
Veerpur	Medieval pottery
Weekar	Sculptures

53. EXPLORATION IN DISTRICT EAST NIMAR.—The Prehistory Branch of the Survey under the direction of S.B. Ota, assisted by N.G. Nikose, N. Taher, J.S. Dubey, R.K. Dwivedi, N.K. Nimje, C. Yadav and P.S. Pashine explored and surveyed Khandwa and Harsud taluks with the aim of ascertaining the archaeological potentiality of the submergence area of Narmada Sagar Dam Project for further implementation of planned investigation, if required, before the area gets submerged. The survey brought to light the following archaeological evidence:

Tehsil	*Village*	*Nature of remains*
Harsud	Abhawa	Acheuhan
-do-	Amulni	Medieval mound
-do-	Baihari (Bir)	Medieval mound
-do-	Balri	Remains of Siva temple (twelfth-thirteenth century AD) locally known as Shankar Mandir, medieval structural remains
-do-	Bamangaon	Medieval mound

Telisil	*Village*	*Nature of remains*
Harsud	Bandariya	Medieval mound
-do-	Bargaon (Mal)	Medieval mound
-do-	Barur	Medieval mound
-do-	Belwari	Microliths (two localities), medieval site
-do-	Beriya	Medieval mound
-do-	Bhawarli	Medieval mounds (two in number), late medieval brick temple, remnants of stone temple
-do-	Bijalpur Kalan	Medieval site with fortification locally known as 'Kotra', late medieval structures, remains of a temple (twelfth-thirteenth century)
-do-	Bijalpur Khurd	Acheulian (four localities), microliths, early historical mound, loose sculptures, memorial stones, iron smelting site
-do-	Billod	Microliths
-do-	Billod (Mal)	Medieval mound
-do-	Blurari	Medieval mound
-do-	Boribandri	Microliths, medieval mound
-do-	Boribandri (Kherkheda)	Microliths
-do-	Chalpa Kalan	Early historical mound
-do-	Chhirwan	Microliths
-do-	Chich	Medieval mound
-do-	Chikhli	Medieval mound (two in mumber)
-do-	Dewaldi	Medieval mound
-do-	Dagarkheri	Late medieval structural remains
-do-	Ganor	Microliths, medieval mound, iron smelting site
-do-	Gehelgaon	Medieval mound
-do-	Gehungaon (Kalan)	Medieval mound
-do-	Gondikhera	Microliths
-do-	Gullas	Middle Palaeolithic tools (two localities), iron smelting site
-do-	Haripura	Medieval site

Tefisil	*Village*	*Nature of remains*
Harsud	Harsud	Remains of a temple (twelfth-thmeenth century) locally known as "Saraswati Kund" with loose sculputres, medieval mound
-do-	Hathnora	Late medieval structural remains
-do-	Jabgaon	Medieval mound
-do-	Jaitapur Khurd	Microliths
-do-	Jalwan	Medieval mound
-do-	Jagria (Mal)	Medieval mound
-do-	Jhirighat	Medieval mound
-do-	Jogibira	Remains of Siva temple (twelfth-thirteenth century), medieval mounds (three in number), loose sculptures, *sati* stones
-do-	Junapami	Medieval mound
-do-	Karauli	Microliths
-do-	Kashipura	Microliths, medieval mound
-do-	Kasrawad	Medieval-mound
-do-	Khudia (Mal)	Middle Palaeolithic tools, medieval mound, late medieval temples
-do-	Khutia	Medieval mound
-do-	Kukdal	Middle Palaeolithic tools, remnants of a temple with Vishnu sculptures (twelfth-thirteenth century), medieval mound
-do-	Kuksi	Medieval mound
-do-	Lachhora	Medieval mound
-do-	Lodhisanthri	Medieval mound
-do-	Mahatpur	Microliths, medieval site
-do-	Malod	Microliths
-do-	Maujwari	Microliths, medieval mound
-do-	Nagpur	Microliths, memorial stones
-do-	Nandgoan	Medieval mound
-do-	Naoghata	Acheulain site
-do-	Nazarpura	Microliths, medieval mound
-do-	Newalkhera	Middle Palaeolithic tools, microliths, early historical mound, Vishnu image
-do-	Pangeria	Medieval site
-do-	Panghat (Kalan)	Sculptures of Ganesa, inscription in Devanagari script

Tehsil	*Village*	*Nature ofreniains*
-do-	Singaji	Medieval sites (five in number)
-do-	Saktapur	Medieval mound
-do-	Sarai	Acheulian (two localities)
-do-	Semrur (Mai)	Medieval mound
-do-	Sodia	Microliths, medieval site
-do-	Sonpura	Medieval mound
-do-	Susarel	Remains of brick temple
-do-	Torniya	Microliths, temple remains
Khandwa	Balwara	Acheulian
-do-	Jamoti	Acheulian, microliths, loose sculptures
-do-	Purni	Acheulian (two localities), microliths (two localities), early historical and medieval mounds, iron smelting site

Acheulian sites are mostly confined to the Vindhyan region on the left bank of the Narmada. These are all open-air sites mostly confined to the foothill zones except the locality III at Bijalpur Khurd which is located at a height of more than 1100 (335 m) above MSL. Most of these sites comprise more than one locality and are surfacial in nature except Bijalpur Khurd locality III and Balwara (pl. XXI A) which preserve a rich cultural deposit. On the basis of the typo-technological characters of the assemblage, it may be assigned to late Acheulian phase. The assemblage comprises handaxes, cleavers, discoids, choppers, large number of utilized simple artefacts, etc. Quartizite as the major source of raw material has been utilized for fabricating the artefacts. Apart from quartzite, cherty type material has been utilized as raw material at Sarai and Abhawa. It has been noticed that locally available raw material has been exploited for manufacturing tools.

Middle Palaeolithic sites so far located are all open-air surface sites occurring in the context of barren tableland, rocky ridges and hillocks, mostly in the Deccan Trap area. The assemblage (pl. XXII) belonging to this cultural phase comprises mostly varieties of scrapers, points, utilized flakes, etc., apart from simple artefacts. Raw material used is mainly quartzite and sometimes locally available chert as at Khudia.

As regards the microlithic industry, the area is extremely rich. These sites are mostly confined to the undulating Deccan Trap region concentrating on both the banks of the Chhota Tawa and mainly on its tributaries. Once again, these are all open-air surface sites except in a few cases where some cultural deposit is suspected. These sites occur in the context of barren land, rocky ridge and hillocks, very close to the perennial or seasonal water bodies. The most noteworthy feature, observed at certain sites like Gondikhera, Boribandri (Kherkheda) and Charkhera, is that microliths occur in association with some of structural remains. From the nature of occurrence and composition of assemblage it seems to belong to recent period which may be ascribed to the activities of some recent tribal communities. The microlithic assemblage in general is characterized by the occurrence of very few

number of utilized flakes, and simple artefacts such as flakes and chips, cores, worked nodules, etc. Chalcedony as the major raw material is used apart from a minor use of chert which occur in pockets in Deccan Trap.

With a view to ascertaining the stratigraphical position and associated finds of early historical sites, a trial trench measuring 20 x 10 m was laid at Bijalpur Khurd. A maximum cultural deposit of about 1 m was encountered overlying the black soil. The ceramic industry of this period is characterized by the occurrence of black-and-red ware, black-slipped ware and black polished ware apart from plain red ware and red-slipped ware. Burnishing is very common on the pottery.

Black-and-red and black polished ware are of medium fabric and are prepared from well-levigated clay. Red ware occur both in thin and thick fabric. The shapes include mostly bowls, jars, etc. Carination on the pots is almost absent. Apart from pottery, other antiquities from the site at Bijalpur Khurd include saddle quern, grinding stones, anvils, burnisher, hopscotch and shell objects (pl. XXI B-C). A large number of animal bones mostly of *Bos* sp. occur at all the levels. Iron slag and corroded iron objects do occur at all levels in the trial trench. Floor levels in the form of lime platform has also been observed. On the basis of cultural affinity with early historic horizon at Maheshwar and Navdatoli, the early historical level at Bijalpur Khurd can be dated back to about second-third century AD.

Apart from early historical mounds, a large number of medieval mounds have been located very close to the present day villages. At some of these mounds rubble fortification has been noticed. The most significant discovery belonging to this cultural phase has been located in the village jurisdiction of Bijalpur Kalan, which is locally known as "Kotra". This site contains rubble fortification wall with elaborate structural remains in a well planned fashion. The burial ground associated with this site has also been located. The stone (pl. XXIII A) and brick antiquities collected from the site include a brick with incised design (pl. XXIIIB), saddle quern, stone potter's wheel, stone lamp and grinding stone. Apart from these, cowries, glass bangles and beads (both of lac and stone) have also been collected. The metal objects (pl.XXIIIC) picked up from the site include iron nail and bangle and a copper ring.

Temple remains noticed at a number of villages can tentatively be divided into three successive phases. Temples belonging to the earliest phase are all brick constructions as at Harsud, Balri and Susarel. The second phase of temple construction is characterized by stone construction with elaborate carvings and fine sculptural remains, which have been noticed at Kukdal, Harsud, Jogibira (pl.XXIV A-B), Balri and Bijalpur Kalan. On the basis of iconographic features and temple styles, the temples can be ascribed to twelfth-thirteenth century AD. Temples of third phase are characterized by both brick and stone construction as at Khudia (Mal), Torniya, Bhawarli, Bijalpur Kalan, etc. These are all plain constructions without any carvings, belonging to late medieval times.

Structural remains comprising tombs, houses, wells, and some unidentified structures belonging to late medieval times have also been noticed. These structures are constructed of dressed stones or *lakhauri* bricks, and lime has been used as mortar.

Of the loose sculptures, mention may be made of image of Vishnu noticed at Bhilgarh in village Jamoti, Kukdal and Newalkhera and Ganesa at Bijalpur Khurd and Panghat (Kalan). On iconographic and stylistic grounds, these sculptures probably belong to twelfth-thirteenth century AD. Apart from

this some unidentified pieces have also been noticed. An inscription in Devanagari characters belonging to thirteenth-fourteenth century AD has been noticed in a modern shrine at Panghat (Kalan). Sculptures of Hanuman carved on a slab in low relief associated invariably with all medieval habitational sites is the typical feature observed in the area.

Sati memorial stones which have been noticed are square in plan and pillar-type, standing upright on the ground (pl.XXIV C). It depicts the figures of horse-rider, the sun and the moon, *sati* sacrifice, etc.

A number of iron smelting sites have been noticed which occur isolatedly in the form of a heap of iron slags rising about 1 to 2 m in height. These sites are mostly confined to the Vindhyan and its adjoining areas on the southern bank of Narmada which is rich in iron-ore deposits. The antiquity of iron smelting activity in the area goes back to early historical times, which is confirmed during the trial diggings at Bijalpur Khurd.

54. EXPLORATION IN HARSUD TALUK, DISTRICT EAST NIMAR.—Excavations Branch I of the Survey under Amarendra Nath, assisted by S.K. Lekhwani, K.P. Rao, S. Pratapchandran, N.K.S. Sharma and H.J. Barapatre undertook exploration in Harsud Taluk of the submersible areas under Indira Sagar Project. The noteworthy results included a number of sites ranging from pre-historic to historic period.

Among pre-historic sites, mention may be made of the spread of Lower Palaeolithic sites along the Narmada on its north bank. Tools were picked up from the floor terrace of Narmada and its tributaries, deposited over the alluvium. The river section which is about 25 m high at few places was of eroded Deccan Trap and its conglomerate covered by a thick deposit of alluvium over the flood plains. The tools, recorded as surface finds, suggest by its typotechnology a mid to late pleistocene age, keeping in view the reports of mid and late pleistocene fauna fossils in the adjoining area of Narmada in similar geomorphological setting. The lower palaeolithic tool types included hand-axes, cleavers, points, scrapers, etc (fig. 4).

The hand-axes made on cores without the cortex and a straight working edge indicate a late Acheulian proximity to the industry. A few knives made on mega-flakes with secondary retouches on working edge gives similarity to highly evolved Acheulian industries reported from Madras as well as South Africa. The quartzite outcrops were natural source of raw material for the pre-historic people of this region. Sites were located around Boria (22° 14' N; 76° 32' E), Chandgarh (22° 16' N; 76° 37' E) (also refer *1960-61*, p. 61), Jatam (22° 16' N; 76° 35' E), Kaladev (22° 20' N; 76° 32' E), Mathni (22° 16' N; 76° 34' E), Nawghat (22° 15' N; 76° 37' E), Pamakheri (22° 20' N; 76° 36' E) and Pandiyadeh (22° 16' N; 76° 38' E) on the north bank of the Narmada, while similar stone age sites were also discovered on the south bank of the Narmada around Abhawa (22° 14' N; 76° 38' E), Balri (22° 14' N: 76° 41' E, also refer *1974-75,* p. 24), Bargaon Raiyat (22° 12' N; 76° 46' E), Jamunya (22° 15' N; 76° 43' E), Nawghat (22° 15' N; 76° 38' E) and Nirguria Mal (22° 11' N; 76° 36' E). Microliths have earlier been reported from this site (*1960-61,* p. 61).

The Middle Palaeolithic tools (fig. 5) collected from this area by its technotypological study also indicate its affinity to late Pleistocene on the same analogy as noted above. Majority of the tool types

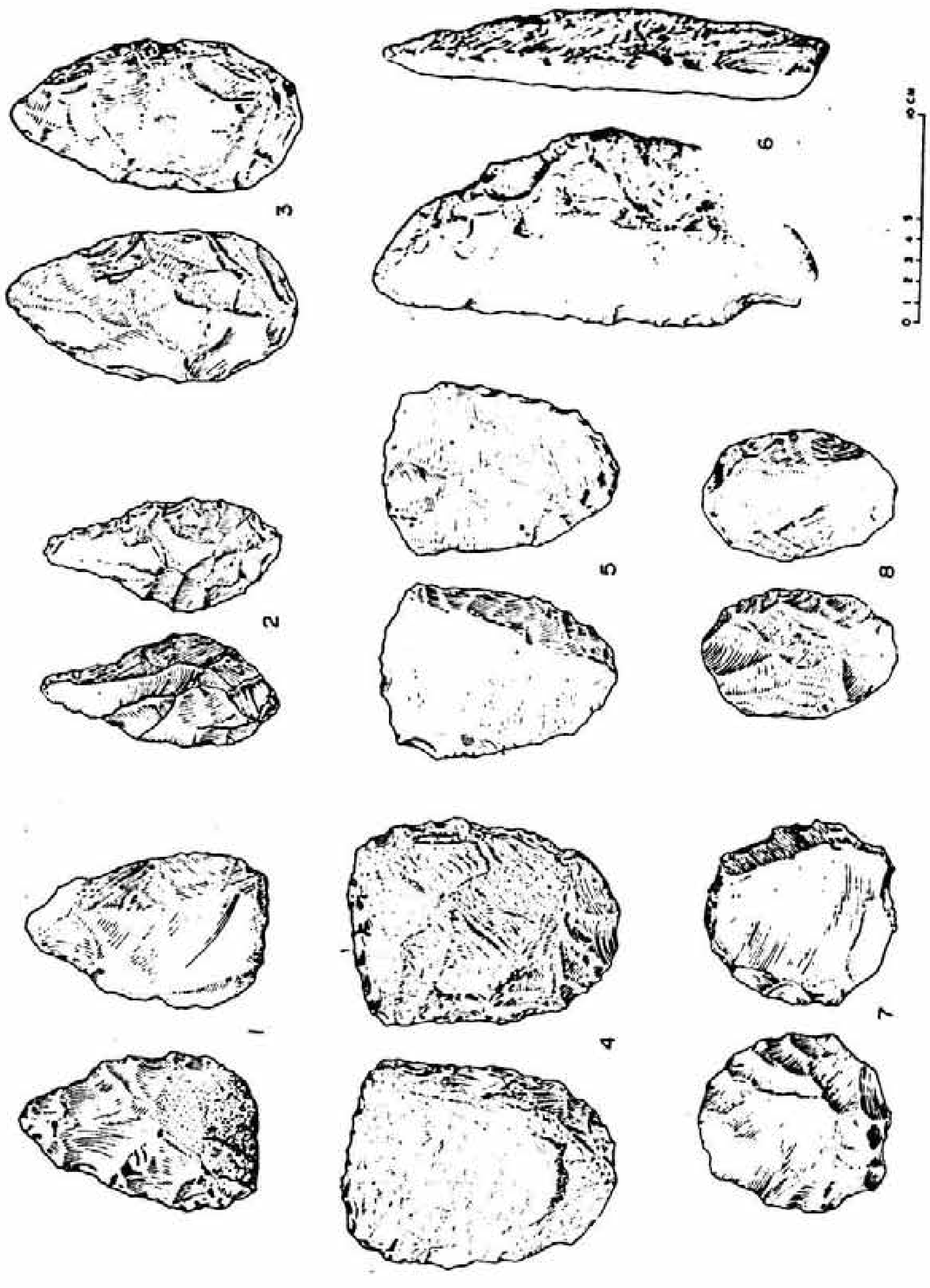


FIG. 4. *Lower Palaeolithic tools : 1-3, 5, Balwara; 4, Abhawa; 6, Bosia; 7, Chandel; and 8, Jatam*

belong to scraper industry with variants like round, side or convex-edged ones made on secondary flakes while a few scrapers were made on cores also. Points also make up an appreciable percentage in the collection of tools which by its typotechnological features can be compared to Mousterian points. Some of these had a short tang for hafting. Interesting to note among other tool types are diminutive hand-axes. These predominantly flake tools are meticulously made showing fine retouch. Quartzite was mostly used while a few chert and jasper tools were also found. Sites of this period were generally spread along the lower Chhota Tawa intermixed with flood plains on either banks. On the northern bank of the Narmada, a notable site of Middle Palaeolithic industry was discovered at Anjaniya (22° 17' N; 76° 39' E) while the southern bank yielded sites of this industry at Balikeshwar (22° 16' N; 76° 40' E), Balri *(1974-75,* p. 24), Gondikhera (22° 01' N; 76° 40' E), Jhagria Raiyat (22° 13' N; 76° 43' E), Kharuwa (22° 10' N; 76° 35' E), Khudia Mal (22° 14' N; 76° 43' E), Kotra Bijalpur Khurd (22° 13' N; 76° 36' E), Malod (22° 10' N; 76° 43' E), Newalkhera (22° 10' N; 76° 39' E), the site had earlier yielded microliths *(1960-61,* p. 61), Nirguria Theka (22° 10' N; 76° 36' E), Regwan (22° 08' N; 76° 38' E), Somapura (22° 14' N; 76° 40' E) and Sonpura Mal (22° 09' N; 76° 37' E).

The spread of microliths was noticed mostly from sites found along the right bank of upper Chhota Tawa and its seasonal tributaries. The assemblage included a variety of tools like blades with and without retouching, lunates, trapezoids, points, scrapers and arrowheads (fig. 6). The arrowheads, especially one from Kasrawad and another from Undwa by their typotechnological feature suggesting a mesolithic affinity, and deserve special mention. In this collection utilized flakes are many. The assemblage of cores reveals a good number of fluted ones, besides irregular varieties. Most of the tools were made out of chalcedony, chert, jasper, besides a few were attempted on quartz and rock crystals. These microlithic sites were located within the revenue limits of the villages namely Amulni (22° 04' N; 76° 42' E), Balikeshwara Bandariya (22° 05' N; 76° 49' E), Barkeshwar (22° 17' N; 76° 41' E, lower palaeoliths have been reported from this site earlier, *1960-61,* p. 61), Barur (22° 02' N; 76° 44' E), Berian (22° 00' N; 76° 38' E), Bharari (22° 03' N; 76° 43' E), Bharkali (22° 05' N; 76° 44' E), Boria Boribandri (21 ° 59' N; 76° 43' E), Bothiya Khurd (22° 02' N; 76° 50' E), Brahmogram (22° 01' N; 76° 42' E), Charkhera (21° 57' N; 76° 39' E), Chich (22° 06' N; 76° 50' E), Dagarkheri (22° 04' N; 76° 49' E), Dotkhera (22° 00' N; 76° 44' E), Gondikhera, Gullas (22° 12' N; 76° 39' E), Harsud (22° 06' N; 76° 44' E), Hathnora (22° 04' N; 76° 48' E), Jabgaon (22° 10' N; 76° 38' E), Jaitapur Khurd (22° 08' N; 76° 42' E), Jogibira (21° 54' N; 76° 40' E), Kashipura Mal (22° 02' N; 76° 46' E), Kashipura Mauja (22° 02' N; 76° 45' E), Kasrawad (22° 02' N; 76° 42' E), Malod, Mugal (22° 05' N; 76° 48' E), Nandgaon Khurd (22° 59' N; 76° 38' E), Nawghat, Nimkhera (21° 53' N; 76° 39' E), Palani Mai (22° 03 N; 76° 38' E), Patakhali (22° 07' N; 76° 38' E), Pratap Pura (21° 59' N; 76° 40' E), Punghat Kalan (22° 18' N; 76° 46' E), (also see *1959-60,* p. 69), Punghat Khurd (22° 19' N; 76° 47' E), Rewapur (22°03'N; 76°44'E), Selda(21°57'N; 76°37'E), Somapura, Surwadia (21°56'N; 76°35' E), Tomiya (22° 01' N; 76° 45' E), Undwa (22° 06' N; 76° 39' E) and Undel (21° 56' N; 76° 34' E).

The explorations have brought to light an interesting distribution pattern of prehistoric sites in the Chhota Tawa basin. Majority of the Lower Palaeolithic sites are located on the left banks near the confluence of the Chhota Tawa and the Narmada. However, on the corresponding right bank of the Narmada are some of the best palaeolithic sites which need further investigations. Some of the rich

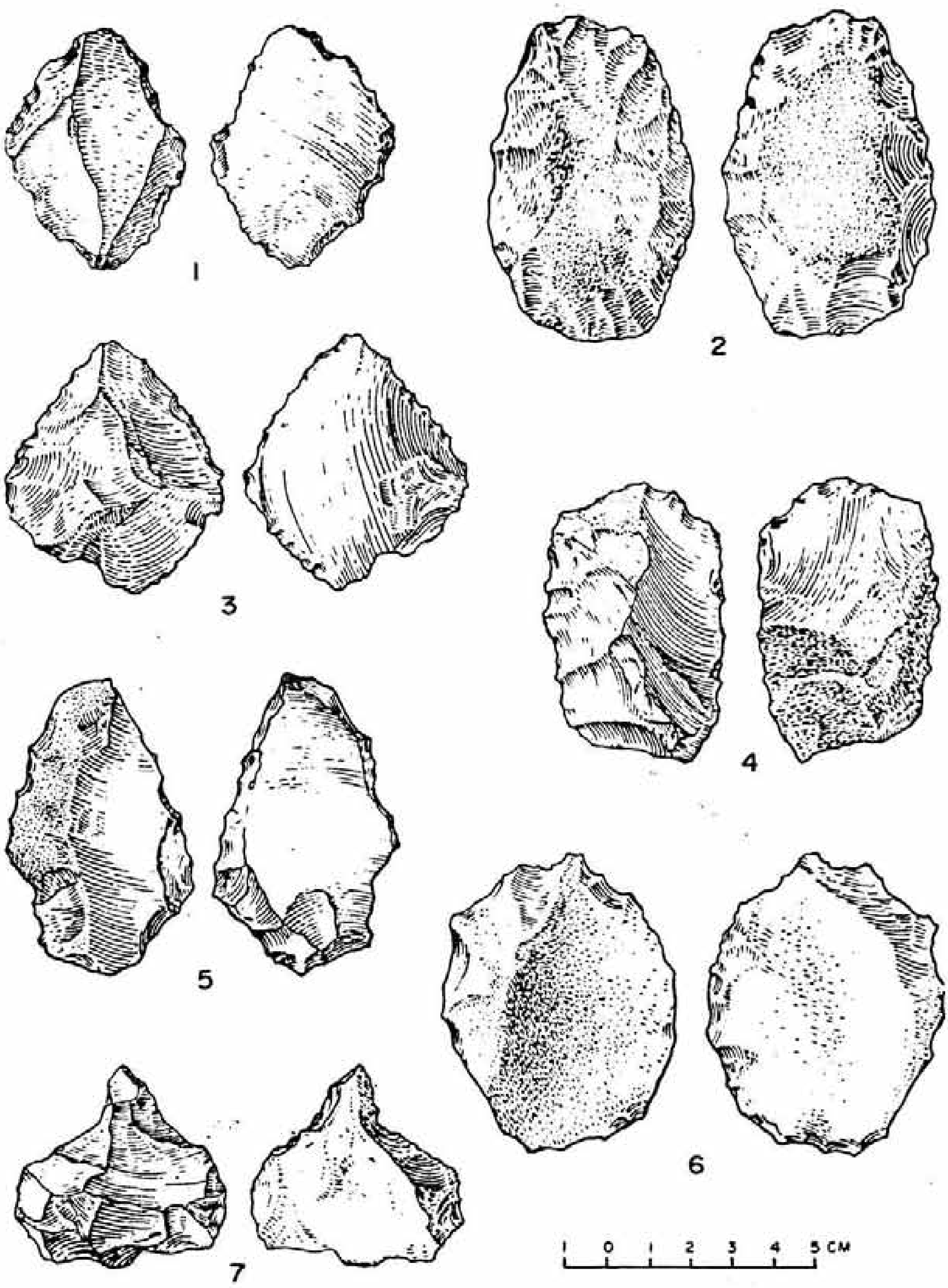


FIG. 5. *Middle Palaeolithic tools : 1, Somapura; 2, Khudia Mal; 3, Malod; 4, Gondikhera; 5, 6, Nirguria Theka; and 7, Balikeshwara*

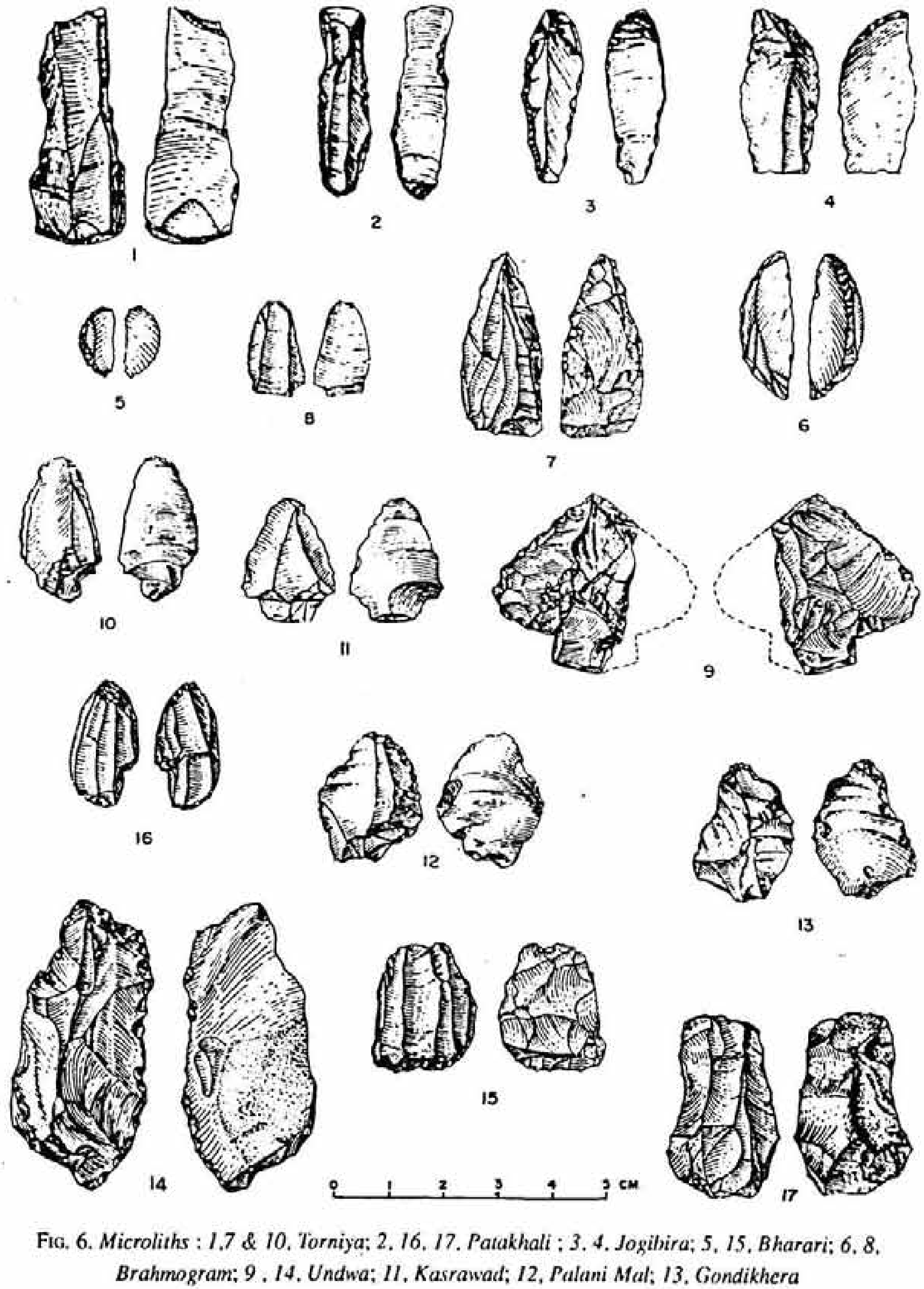


Fig. 6. *Microliths : 1,7 & 10, Torniya; 2, 16, 17, Patakhali ; 3, 4, Jogibira; 5, 15, Bharari; 6, 8, Brahmogram; 9 , 14, Undwa; 11, Kasrawad; 12, Palani Mal; 13, Gondikhera*

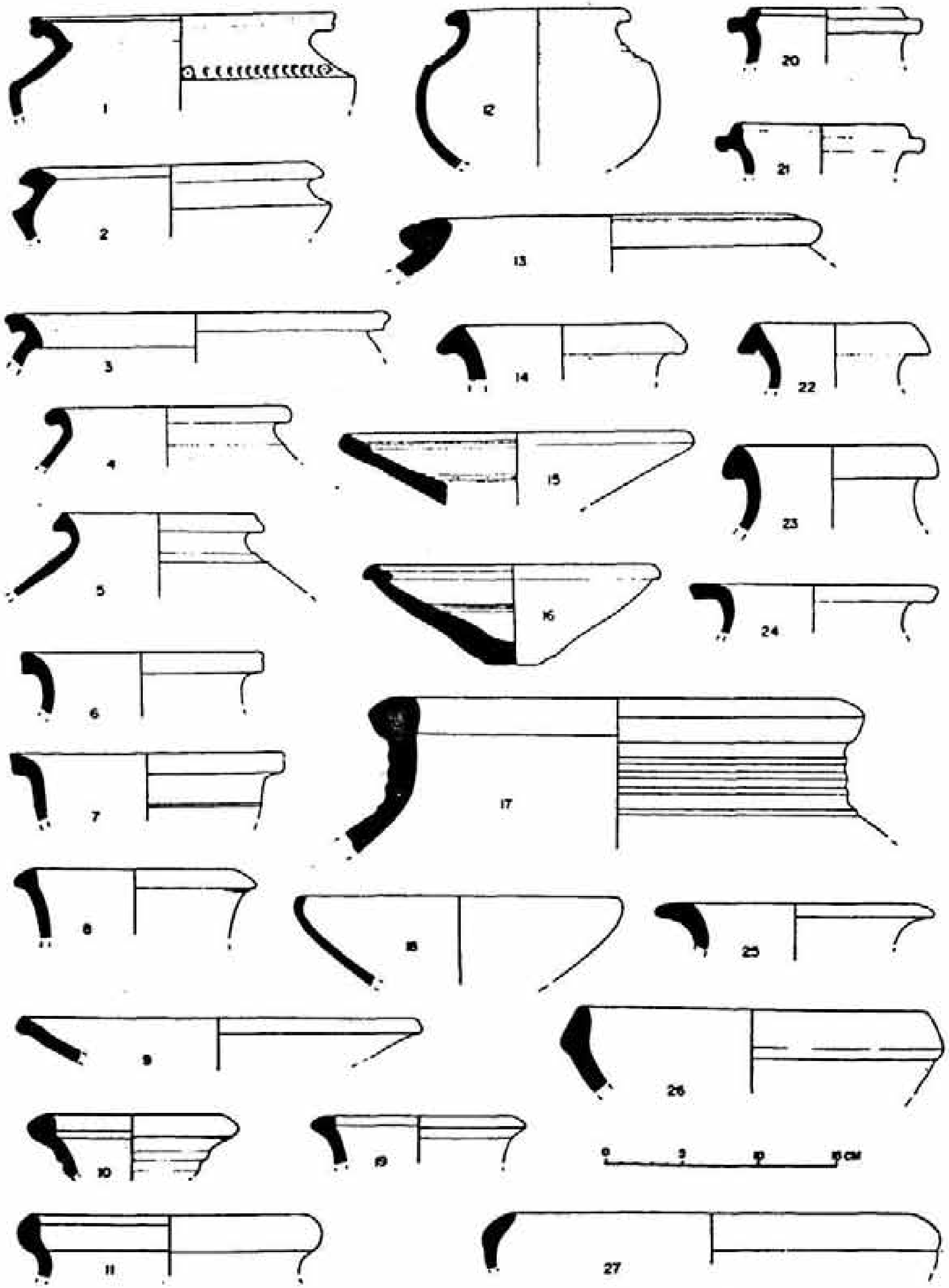


FIG. 7. *Pottery types : 1-5, 12-16, 20-24, Boribandri; 6-11, 17-19, 25-27, Newalkhera*

Middle Palaeolithic sites are distributed in the lower right basin of the Chhota Tawa and corresponding left bank of the Narmada. On the other hand, with a few exceptions, most of the microlithic sites are concentrated in the central valley of the Chhota Tawa and its tributaries like the Ruparel and the Ghorapachar.

A few early historic potsherds of black-and-red ware variety, were noted from a mound on the junction of the Narmada and the Pandiyadesh *nala* within the revenue limits of Chandgarh village. Some more potsherds of similar ware were found from Bijalpur Kalan as well (22° 11' N; 76° 35' E). The potsherds were mostly of coarse fabric and ill-fired. The fragments of the sherds indicate parts of bowls, basins and jars. The village had earlier yielded both Lower and Middle Palaeolithic tools (*1960-61,*-p. 61).

Medieval remains included habitation mounds, dilapidated temples, disturbed tombs, loose sculptures and a few memorial pillars. Ancient mounds were noticed at Boribandri, Harsud Garhi, Kashipura Mal, Kashipura Mouja, Kotara (Bijalpur Khurd) and Newalkhera. The finds from the mounds can be bracketed into early historical and medieval periods. The pottery of the early historical period is characterized by red ware whereas in the. later period it is distinguished by darkish-grey ware, coarse in fabric and poor in treatment (fig.7). An occasional use of red slip is noticeable. Likewise, burnishing would also be seen on a grey ware sherds. In both the categories incised and stamped designs are found. The designs are parallel, wavy, zig-zag and oblique lines, circle, etc. On one sherd, incised circles in a parallel row were found as decoration on the raised horizontal band. There are fragments of rims of basins, jars, globular pots, miniature pots, spouts and lids. Of the two coins one is a Gadhaiya coin of billon from Boribandri Garhi with its obverse showing the bust of a king to the right and a fire altar motif on the reverse. The other is a weather beaten, round copper coin of Akbar, issued from Bairat mint, discovered from Kashipura Mauja.

An 'L' shaped brick structure was noticed on the surface at Boribandri Garhi which looked like a pan of an early medieval brick temple; the size of the bricks used varied from 35 x 21 cm to 28 x 22 cm, while the approximate thickness of the wall was 1.25 m. Another important historical site was noticed at Kotara, under the revenue limits of Bijalpur Khurd, situated on the right bank, close to the confluence of the Chhota Tawa and the Narmada. The site has a fortification of random rubble and mud. Inside the fortification chambers on either side of the lane were found a row of five brick built structures of religious nature assigned to late medieval period. Semrur Mal (22° 13' N; 76° 48' E) on the banks of the Samdehi river, yielded a few grey potsherds of medieval period from a field near the village. The types are similar in fabric as described above.

Temple ruins of the medieval period were located at Khudia Mal and Panghat Kalan. A *Samadhi* erected for saint Singhaji (AD 1575-1616), is a living vestige as it is under worship at the Singhaji village (22° 02' N; 76° 37' E). Near the village Susrel (22° 08' N; 76° 40' E) at the confluence of Kali Machak and Chhota Tawa, foundations of a medieval temple was noticed. At Bhawarli (22° 07' N; 76° 46' E), a partially dilapidated tomb belonging to a Burhanpur ruler was recorded.

Loose sculptures were common finds from almost all the villages mentioned below which apparently show evidences of medieval occupation of this region. Some of these sculptures are kept in the local temples and worshipped while others are still left as it is. The sculptured fragments are

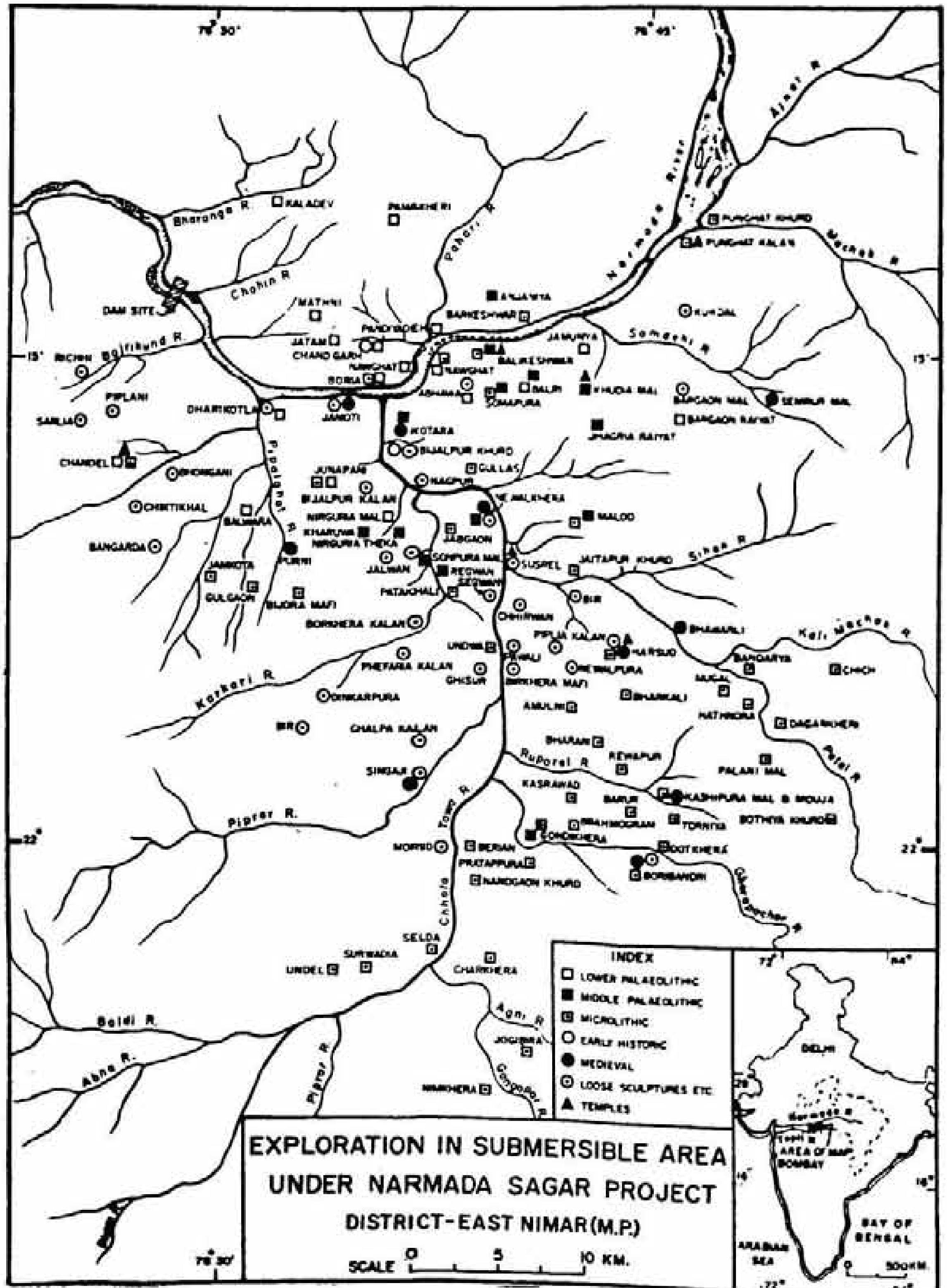

EXPLORATION IN SUBMERSIBLE AREA
UNDER NARMADA SAGAR PROJECT
DISTRICT-EAST NIMAR (M.P.)
SCALE 0 5 10 KM.
INDEX
LOWER PALAEOLITHIC
MIDDLE PALAEOLITHIC
MICROLITHIC
EARLY HISTORIC
MEDIEVAL
LOOSE SCULPTURES ETC
TEMPLES
DAM SITE
Narmada River
BAY OF BENGAL
ARABIAN SEA
DELHI
BOMBAY

FIG. 8

worked on trap-rock, sandstone, besalt etc., these include Ganesa, Hanumana, Vishnu, Siva, Bhairava, Surya, Nandi, Lakshmi and Parvati in different forms and attributes. These were found from Abhawa, Bargaon Mal (22° 13' N; 76° 46' E), Bijalpur Kalan, Bir (22° 07' N; 76° 42' E), Boribandri, Birkhera Mafi (22° 05' N; 76° 40' E), Borkhera Klan (22° 07' N; 76° 36' E), Chalpa Kalan (22°03' N; 76°37' E), Chhirwan (22° 07' N; 76°40' E), Dinkarpura (22° 05' N; 76° 33' E), Ghisur (22° 06' N; 76° 38' E), Harsud, Jalwan (22° 09' N; 76° 36' E), Jogibira, Kukdal (22°'16' N; 76° 46' E), Newalkhera, Newalpura (22° 05' N; 76° 42' E), Pheferia Kalan (22° 06' N; 76° 36' E), Piplia Kalan (22° 07' N; 76° 42' E), Pawali (22° 06' N; 76° 40' E), Segwan (22° 07' N; 76° 39' E), Singaji, Sonpura Mal and Susrel. Memorial stones are common findings from a few villages. These memorial pillars have four sides with a floral top. Sometimes the face of the pillars have carved frames depicting warriors, horse-rider, worshipper and also erotic figures. These memorial stones are reported from villages, viz. Bijalpur Kalan, Bijalpur Khurd (22° 12' N; 76° 37' E), Ghisur, Kukdal, Morud (22° 00' N; 76° 37' E), Nagpur (22° 12' N; 76° 37' E) and Phefaria Kalan.

55. EXPLORATION IN KHANDWA TALUK, DISTRICT EAST NIMAR.—The Excavations Branch I of the Survey under Amarendra Nath assisted by S.K. Lekhwani, K.P. Rao, S.P. Partapchandran, N.K.S. Sharma and H.J. Barapatre undertook explorations in Khandwa taluk of the submersible areas under Indira Sagar Project. The explorations revealed sites of prehistoric importance.

The Lower Palaeolithic sites were represented by tool types such as hand-axes, cleavers, scrapers, cores and utilized flakes forming the industrial debitage. Acheulean technique is indicated by removal of cortex over the hand-axes with parallelogramatic section. The working edges are retouched by alternate flaking. Few specimens have a portion of its cortex retained and the alternate flaking without a soft hammer retouch gives curved cutting edges. Cleavers on flakes are quite normal in usage. Inspite of the presence of a few chopping tools, the Lower Palaeolithic industry in general can be put to the middle to late Acheulean stage by its technique of manufacture which is further corroborated by the presence of tools like points from the collections. Tools were all made on the locally available raw material quartzite. Among the sites, mention may be made of Balwara (22° 10' N; 76° 31' E) which appear as a typical factory site in view of the collection of raw material and various stages of tools manufactured obtained from the area. Other sites yielding similar tool types were Chandel (22° 12' N; 76° 27' E), Dharikotla (22° 13' N; 76° 32' E) and Junapani (22° 11' N; 76° 34' E). Balwara and Dharikotla lies on the banks of Pipalghat, a small tributary of Narmada while Junapani is on the left bank of the Chhota Tawa river.

Microlithic assemblages were noticed in and around the village Bijora Mafi (22° 08' N; 76° 33 E), Chandel, Gulgaon Mal (22° 08' N; 76° 32' E), Jamkota (22° 08' N; 76° 30' E) and Junapani. These sites were mostly located along the left flood plains of the Chhota Tawa. The large number of fluted cores of siliceous material found from these sites reveal basically a blade using people. Besides parallel-sided blades, a few points and lunates were also collected. The amorphous cores reveal production of flakes for scrapers. These tools were prepared out of chalcedony, chert and quartz crystals which are available as natural raw material from the intertrappeans eroded material resting on basal rock of this area.

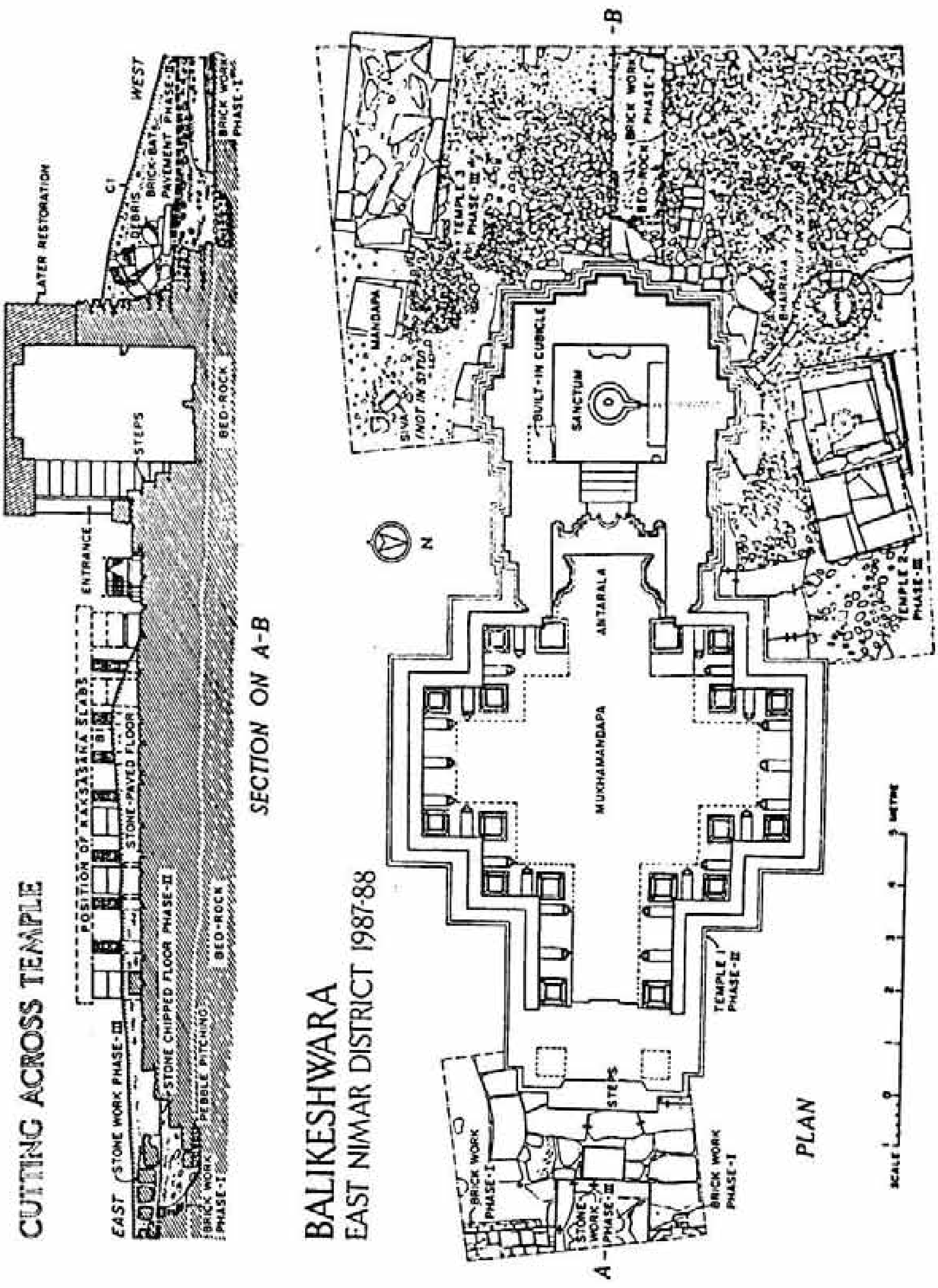

CUTTING ACROSS TEMPLE
EAST
WEST
POSITION OF RAKSASAKA SLABS
STONE-PAVED FLOOR
STONE WORK PHASE-III
STONE CHIPPED FLOOR PHASE-II
PEBBLE PITCHING
BED-ROCK
BRICK WORK PHASE-I
ENTRANCE
STEPS
LATER RESTORATION
DEBRIS
BRICK-BATS
PAVEMENT PHASE-II
SECTION ON A-B
BALIKESHWARA
EAST NIMAR DISTRICT 1987-88
SANCTUM
BUILT-IN CUBICLE
ANTARALA
MUKHAMANDAPA
MANDAPA
SIVA (NOT IN SITU)
BHAIRAVA (NOT IN SITU)
TEMPLE 3 PHASE-III
TEMPLE 2 PHASE-III
TEMPLE 1 PHASE-II
BRICK WORK PHASE-I
BED-ROCK
STONE WORK PHASE-III
N
A
B
PLAN
SCALE

FIG. 9

A few black-slipped ill-fired potsherds with a grey core assigned to medieval period were noticed from the mud-walls of the present village Purni (22° 09' N; 76° 32' E) which indicates the reuse of ancient habitation.

Besides, loose sculptures of Siva-Parvati, Siva-*linga,* Nandi, Chamunda, Vishnu, Lakshmi, Narasimha, Ganesa and broken unidentifiable pieces were noticed from the village Bangarda (22° 09' N; 76° 28' E), Bhongani (22° 12' N; 76° 29' E), Bir (22° 03' N; 7'6° 33' E), Chiktikhal (22° 11' N; 76° 27' E), Dharikotla Madhi (22° 14' N; 76° 32' E), Jamoti (22° 13' N; 76° 34'E), Piplani (22° 13' N; 76° 26' E), Richhi (22° 15' N; 76° 25' E) and Sarlia (22° 13' N; 76° 25' E).

A few sculptures were found at Jamoti, locally known as Bhilgarh Madhi, while at Sukhdev Ashram within a late medieval structural complex some highly worn out loose sculptures of Brahmanical divinities were noticed. Majority of the sculptures were made on locally available buff sandstone.

56. EXCAVATION AT BALIKESHWARA, DISTRICT EAST NIMAR.—The Excavations Branch I of the Survey, Nagpur, under the guidance of Amarendra Nath, assisted by S.K..Lekhwani, K.P. Rao, S. Pratapchandran, N.K.S. Sharma, R.K. Roy, M.U. Qureshi, Mohinder Singh, S.V. Sutaone, P.M. Bhope, H.J. Barapatre, R.D. Ramtakkar, A.U. Ganar, Shahid Akhtar and Sultan Singh carried out a small scale excavation at Balikeshwara (22° 16' N; 76° 40' E) a medieval temple site, situated on the left bank of the river Narmada, about a kilometre north of Balri Revenue Circle with a view to establishing the cultural sequence of the site before its submergence due to the Indira Sagar Project across the Narmada (fig. 8).

The excavation revealed three phases of structural activities, i.e., on preceeding and the other succeeding the temple 1. Phase I (post-Gupta period) is represented by brick structure laid in front and back of the temple. The exact nature and extent of this brick structure could not be ascertained, as it was disturbed by structural activities of Phase II. The lower two courses of the brick wall in offset rest over bedrock and the upper three courses, thereof, are laid in recessed order having outer face chamfered. In all, six brick courses are recorded in the trench laid in front of the existing temple; whereas only two courses of another brick wall of this phase, are seen in a trench cut below the brickbat pavement in the backyard of the temple. The structure is laid in header and stretcher style in mud-mortar. The bricks measure 42 x 26 x 8 cm in size, on an average.

In Phase II the existing Balikeshwara Siva temple, facing east (15.35 x 8.15 m), was built in stone over the remains or brick structures of Phase I by further cutting a shallow pit into bed-rock. In the foundation, river-pebbles were pitched over which two courses of unifinished heavy-duty stone slabs were laid to strengthen the superstructure. On plan, the temple consisted of a *saptaratha* sanctum, an *antarala, mukha-mandapa* with transept and an *qrdha-mandapa* in front (fig.9). The steps leading to the temple were noticed in the trench laid in front of this temple. The entire *sikhara* has fallen. However, the portions of *adhishthana* and *vedika* remain admirably well. The *mukha-mandapa* also was in a ruined state with the ponions above the *kakshasana* dilapidated. The door jamb to the sanctum *in situ,* is embellished with *saptasakha* mouldings (fig. 10). The bottom frames, resting on the door-sill, are carved with standing images of Siva, *salabhanjikas,* Rama and Lakshmana and Bali and Sugriva (?) combat. The lintel, now dislodged, shows carved images of Ganesa and

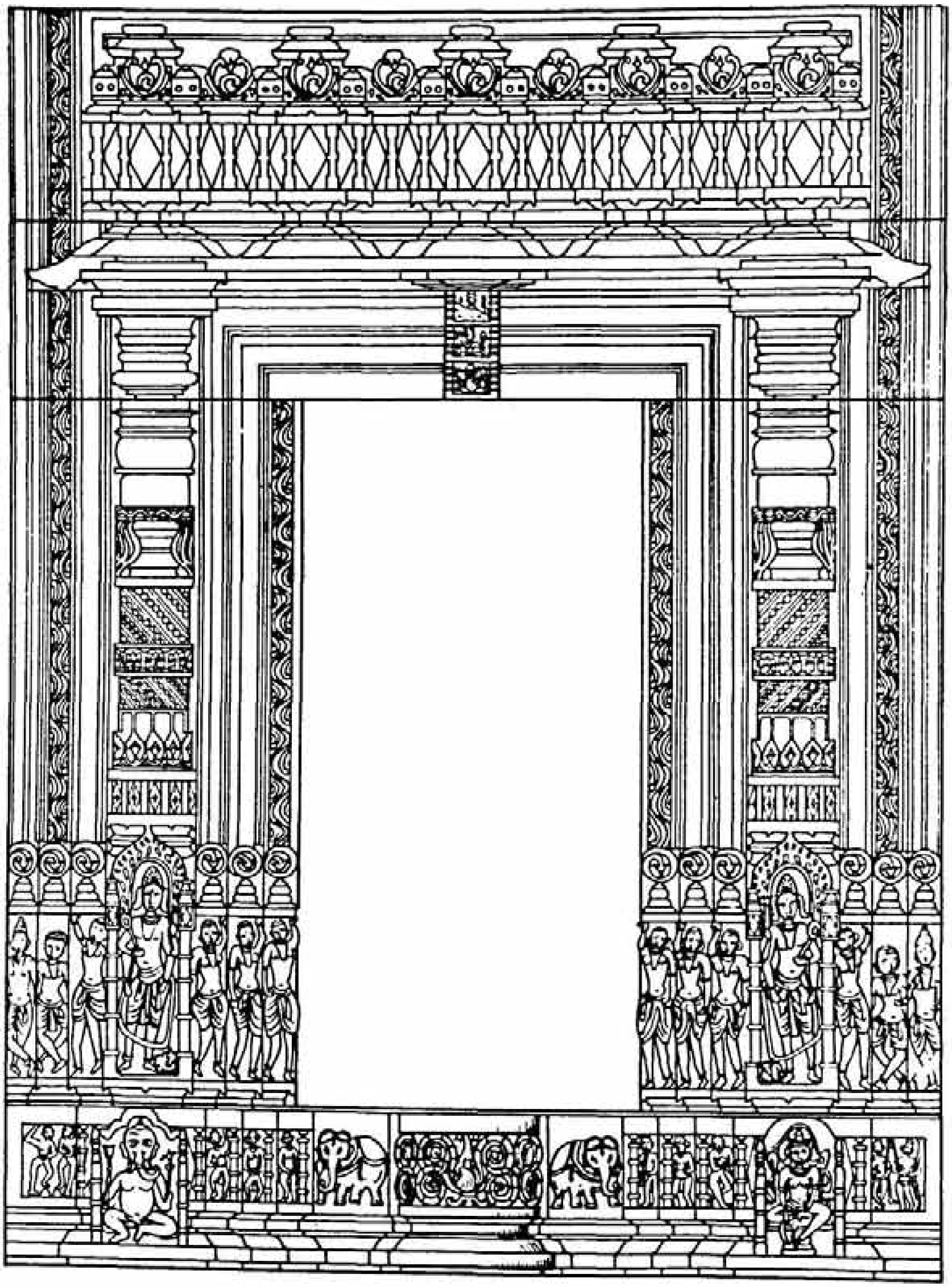


FIG. 10. *Balikeshwara : frame of portal of sanctum*

Lakshmi in the centre. The level of the sanctum is lower than the level of *mukha-mandapa* and the outer pavement. The *mandapa* and the transversed projections in the north and south are bedecked with *vedika* mouldings supported by *kakshasana.*

To the north of the sanctum wall, a circular *kunda* to receive the *abhisheka* water was built reusing the bricks of Phase I. It rests over bedrock and had twenty-one courses with two offsets and a maximum outer diameter of 1.40 m. The covered drain connecting the sanctum and the *kunda* bear traces of lime-plaster.

Debris clearance behind the sanctum of the main shrine of Phase II brought to light architectural members of the temple which helped in preparing a conjectural elevation drawing. The *rekha-sikhara* in *saptabhumija* mouldings could be reconjectured upto finial (fig. 11). Firm in contour and design, the clarity of its vertical edges and provision of its detail pattern are replete with meticulous carvings. The beauty of the temple is further enhanced by the square *gavaksha* element, veiling and linking its strata; at the edges they emerge clean cut. A good number of tiny fragments of sculptures in round, perhaps enshrined in the centre of the *gavaksha,* were recovered from the fallen debris along with stone blocks having *gavaksha* mouldings. A bust fragment of *Vidyadhara* is one of the finest sculptural fragments recovered from the site. In this example the delineation of *patra-kundala* is realistic and suggests gracious movement. Likewise, several loose bracket capitals of pillar depicting caryatids or *kichakas,* as if diving in space, were found scattered on-the site; these may form part of a *rajasika* image of sky. Images of four handed Bhairava (45 x 26 cm) in *lalitasana* and Dakshinamurti (52 x 27 cm) also in *lalitasana* found in the debris immediately over the paved brickbat floor, were originally embellished at the *beki* height of *sikhara* as both had tennon projections; besides the four *bhumija* blocks were located in the debris with mortise to hold the images at the base of the *beki* in cardinal direction.

In Phase III, the structural activities at the site included construction of another Siva-shrine (3.50 x 2.20 m) to the north of the sanctum of the temple 1. It has, on plan, a sanctum followed by a *mandapa* (temple 2). Another rectangular shrine (3.85 x 1.90 m) with a separate *mandapa* was added in the south-west corner. Abutting the *mandapa* a headless Nandi was found, which suggests that the rectangular shrine (temple 3) was dedicated to Siva. In the trench at the steps of temple 1, another *mandapa* (1.75 x 1.35 m) of this phase was recorded. The complete extent of this structure could not be ascertained as the eastern portion of it was embedded in the baulk.

Three copper coins were discovered from debris at the site; one is of the die-struck variety and two are the issues of the Mughals. The die-struck coin bears on the obverse a lizard like creature and on the reverse a seated bull. The coin of Akbar reads on obverse *Darb-i-Bairat* (struck at Bairat) and on the reverse *nuh* (*sad*) (nine hundred) and the coin of Jahangir reads on the obverse *Falus-i-Jahangiri,* struck at Bairat.

Other important antiquities from the site include a thin copper bowl of fine workmanship slightly damaged near the base, a shell bangle fragment (fig. 12. 13) and a stone plaque (8 x 5.5 cm) depicting Vishnu and Lakshmi (fig. 12.2).

57. EXCAVATION AT CHANDEL, DISTRICT EAST NIMAR.— The Excavations Branch I of the Survey,

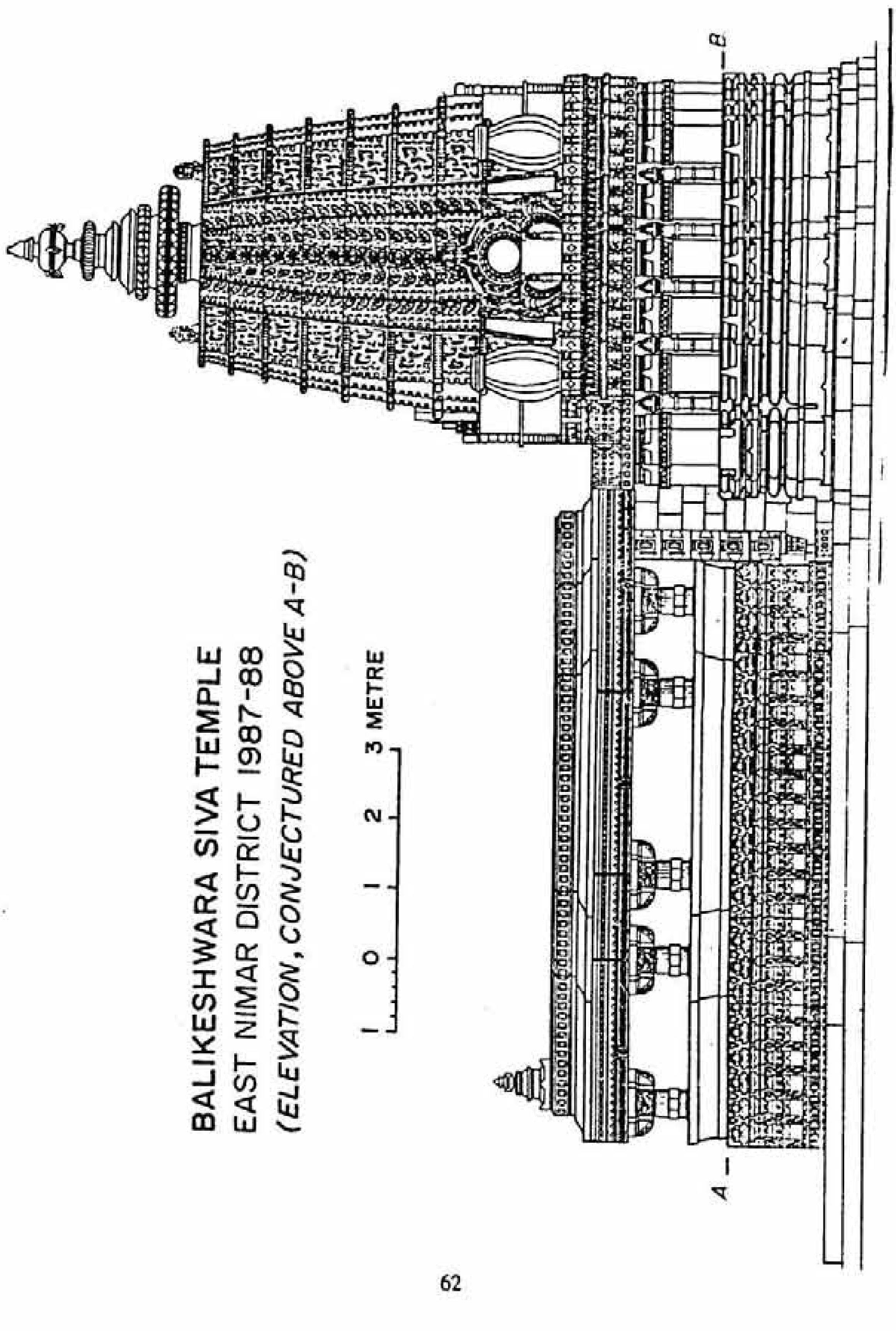

BALIKESHWARA SIVA TEMPLE
EAST NIMAR DISTRICT 1987-88
(ELEVATION, CONJECTURED ABOVE A-B)
0 1 2 3 METRE
A
B

FIG. 11

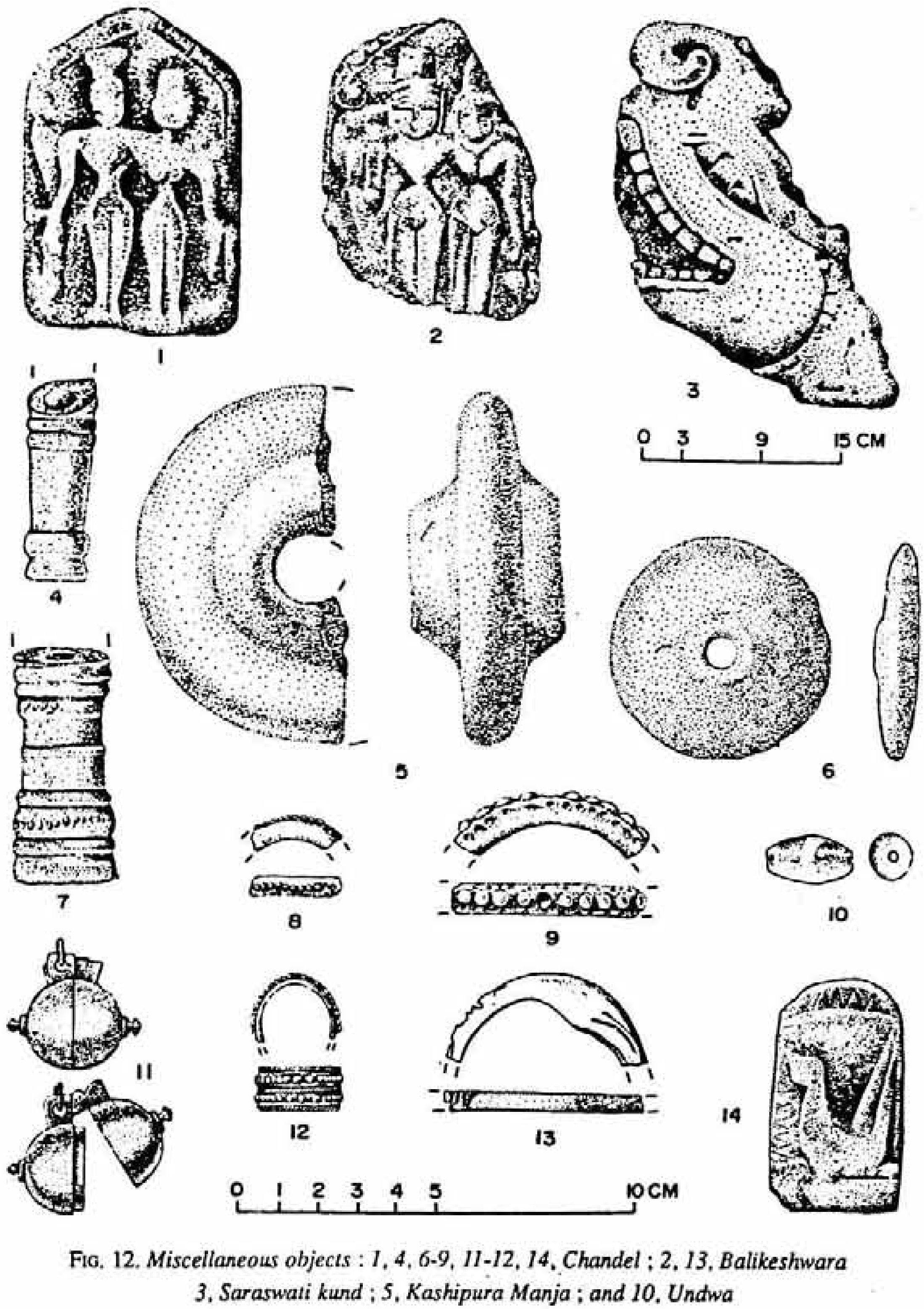


FIG. 12. *Miscellaneous objects : 1, 4, 6-9, 11-12, 14, Chandel ; 2, 13, Balikeshwara 3, Saraswati kund ; 5, Kashipura Manja ; and 10, Undwa*

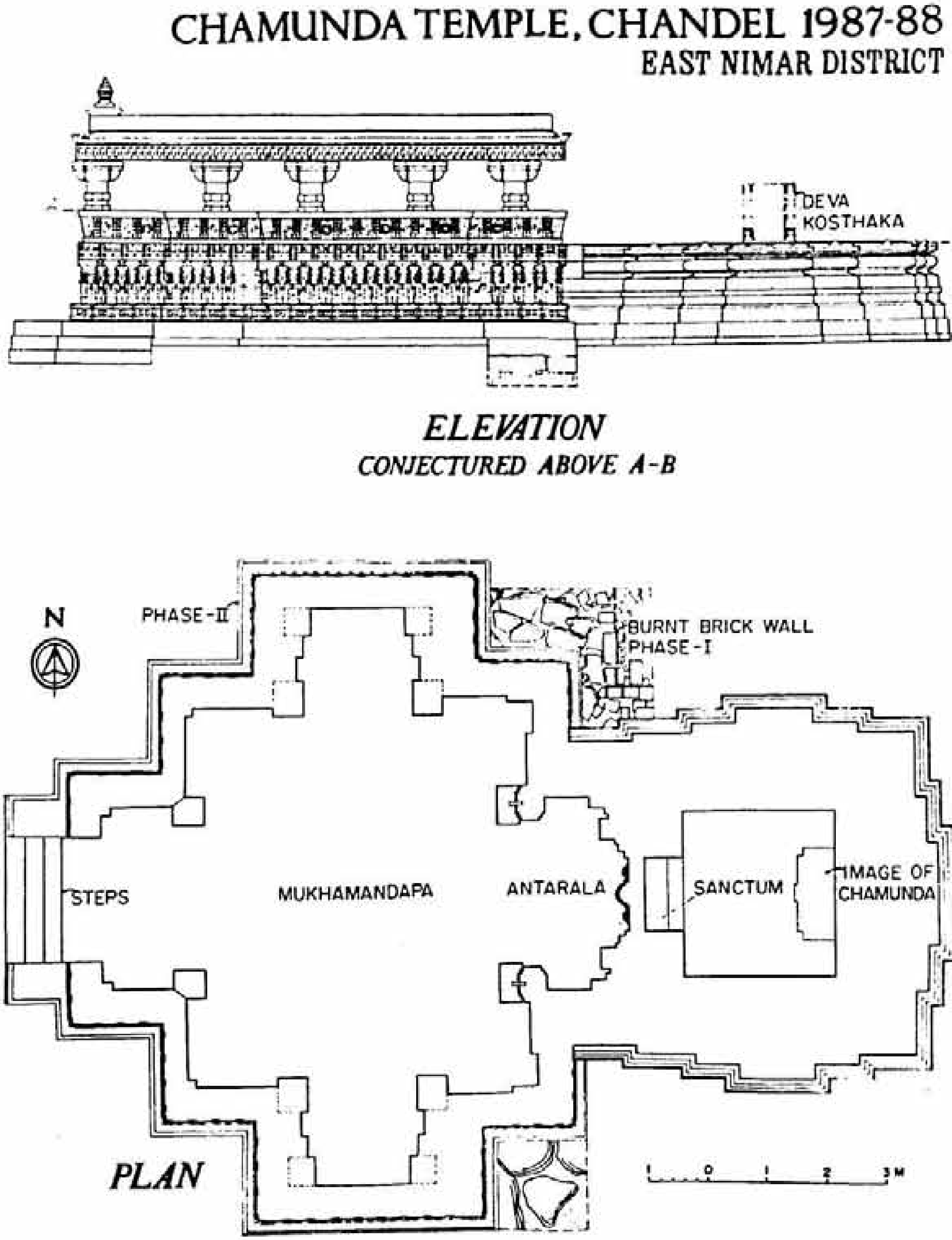

CHAMUNDA TEMPLE, CHANDEL 1987-88
EAST NIMAR DISTRICT
DEVA
KOSTHAKA
B
ELEVATION
CONJECTURED ABOVE A-B
N
PHASE-II
BURNT BRICK WALL
PHASE-I
STEPS
MUKHAMANDAPA
ANTARALA
SANCTUM
IMAGE OF
CHAMUNDA
PLAN
1 0 1 2 3 M

Fig. 13

Nagpur, under the direction of Amarendra Nath, assisted by S.K. Lekhwani, K.P. Rao, S. Pratapchandran, N.K.S. Sharma, R.K. Roy, M.U. Qureshi, Mohinder Singh, S.V. Sutaone, P.M. Bhope, H.J. Barapatre and R.D. Ramtakkar carried out a small scale excavation with a view to exposing, the plan of the temple and to ascertain earlier phases, if any, as the site comes under submergence, due to Indira Sagar Project across Narmada. The temple, facing west and dedicated to one of the Saptalnatrikas—Chamunda, is situated on the western outskirts of the village Chandel (22° 12' N; 76° 27' E), in the Khandwa Taluk.

After a careful clearance of the surface debris, two small trial trenches were laid, one on the northern side abutting the outer wall of the *antarala* and the other on the south-eastern projection of the transept (fig. 13). In the former trench, two courses of a brick structure of ‘L’ shape were noticed, one arm of the same was seen extended below the basal slab of the Chamunda temple. It shows that the existing temple was built over the remains of an earlier structure of religious nature. However, the other trench did not reveal such structure, only basal stone slabs used in the foundation were noticed. The bricks recovered from the site are over-burnt and contain clay mixed with stone chips and heavy sand-particles. Among the moulded bricks, one has gadrooned edge and others have bevelled and semi-circular ends. A few wedge-shaped bricks were also noticed. The brick-size varies between 31.5 x 17 x 6 cm to 17 x 15 x 5 cm.

The temple of Chamunda was built after levelling the said brick structure, over a gentle slope towards west. It was also observed that the lower courses of the sanctum was laid higher than the foundation courses of the *mandapa,* in order to maintain an even level at *adhishthana* height.

Built over a raised podium, the temple (15.5 x 10.5 m) consists of a *pancharatha* sanctum, *antarala,* a *mandapa* with transept in and an *ardha-mandapa* in front. The doorway of the sanctum, now dislodged, is embellished with mouldings. In the bottom frames, on either side of the *dvarasakhas,* are carved in low relief, the standing images of Bhairava followed by *apsaras* (ramification of *salabhanjika).* The images of Ganesa and Lakshmi are carved in low relief, one above the other, in the central offsets of the *lalatabimba* (fig. 14). In the sanctum there is a defaced image of Chamunda in *alidha.* The *mandapa* with lateral projections on northern and southern sides is intact upto the *kakshasana* level. The slanting backrest slab of the *kakshasana,* juts out from the vertical *vedika,* is decorated with *chakra,* pairs of beaded uprights and planks with scroll motifs, appear alternately; each motif has been carved within a separate rectangular frame. These decorations, appear to be common in central India, can be compared with Chandpur temple (*1979-80,* pl. XLV B) in District Lalitpur.

Of the *ardha-mandapa,* except the three flight of steps nothing was found *in situ,* but in the deposit adjacent to steps revealed some fallen decorative members, that helped in reconstructing a conjectural elevation both of the *mandapa* and the *ardha-mandapa.* Likewise, some *sikhara* components and *devakosthakas* have also been retrieved in the deposit outside the *pancharatha* sanctum. Consequently, in the debris a four-handed image of Andhakasuravadhamurti (86 x 50 cm) in *pratyalidha* (pl. XXV A) found close to southern *Bhadra,* and a four handed image of Chamunda (88 x 47.5 cm) standing over a corpse (pl. XXV B) found abutting the northern *bhadra,* suggest their position in the respective *devakosthakas* as the length and width of the images correspond to the

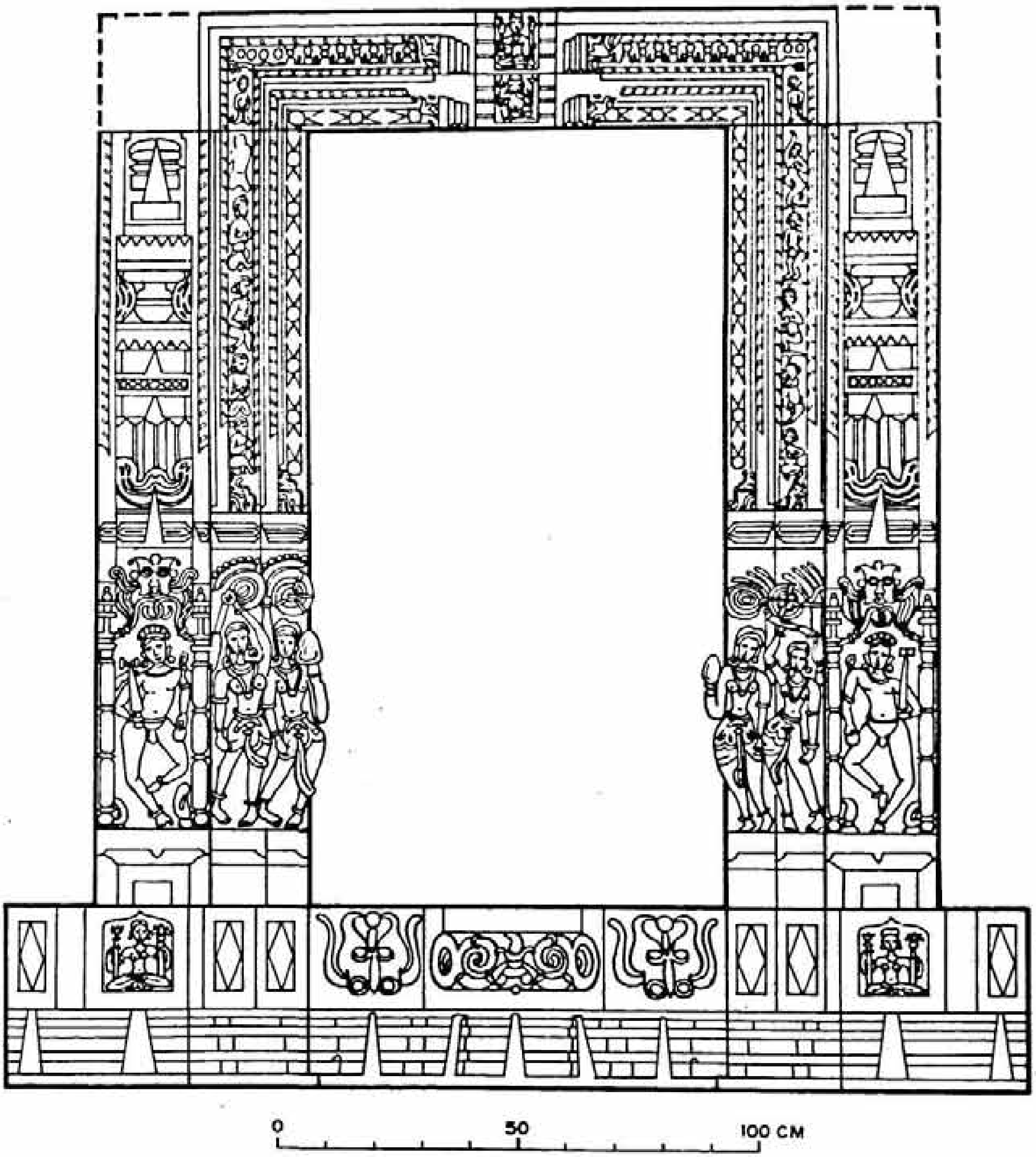


FIG. 14. *Chandel : frame of portal sanctum*

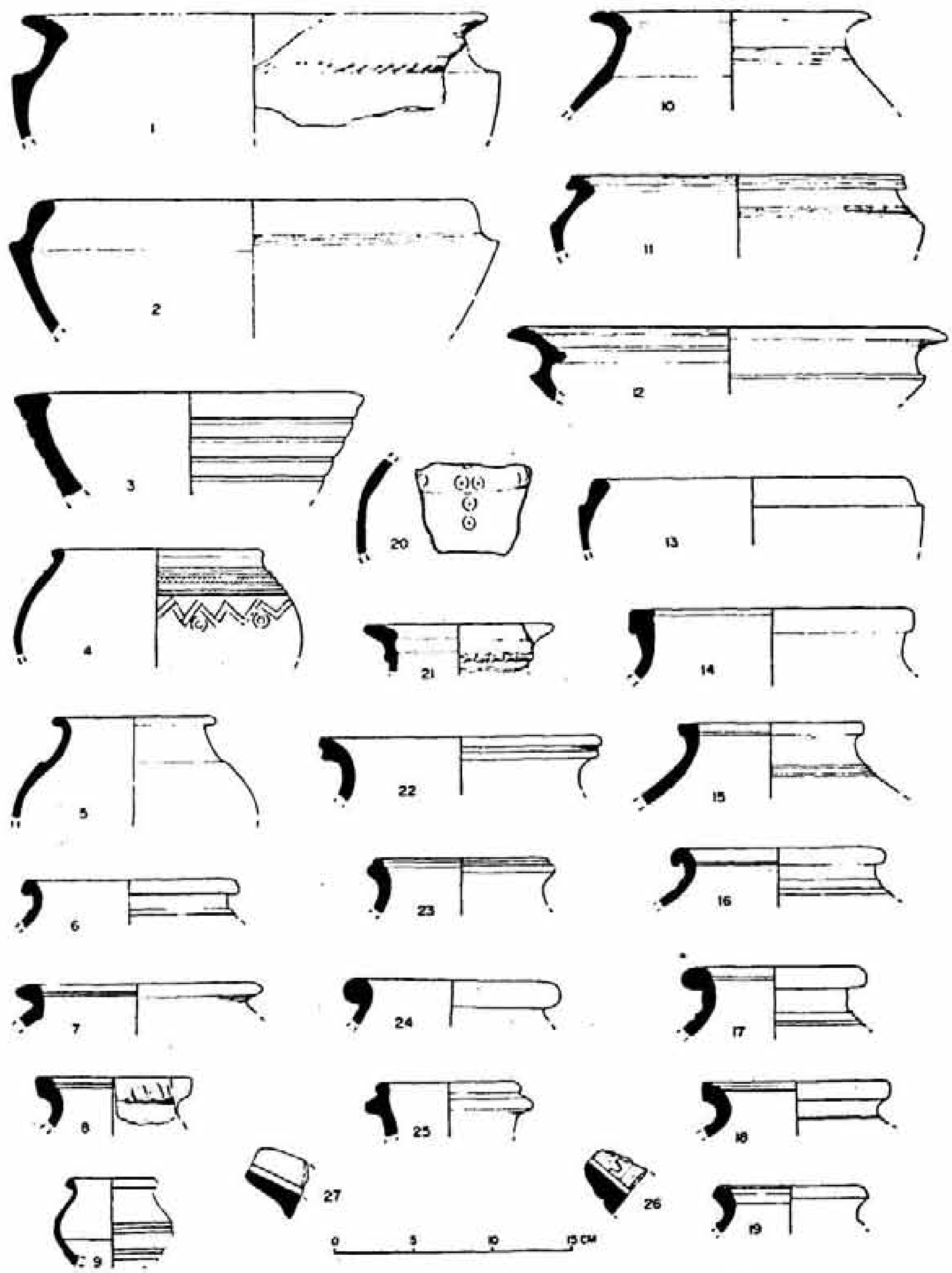


Fig. 15. *Chandel : pottery types, 1-2, 4, 6, 8, 15-18, 20-21, 27, grey ware ; 3, 5, 7, 9, 10-14, 19, 22-26, red ware*

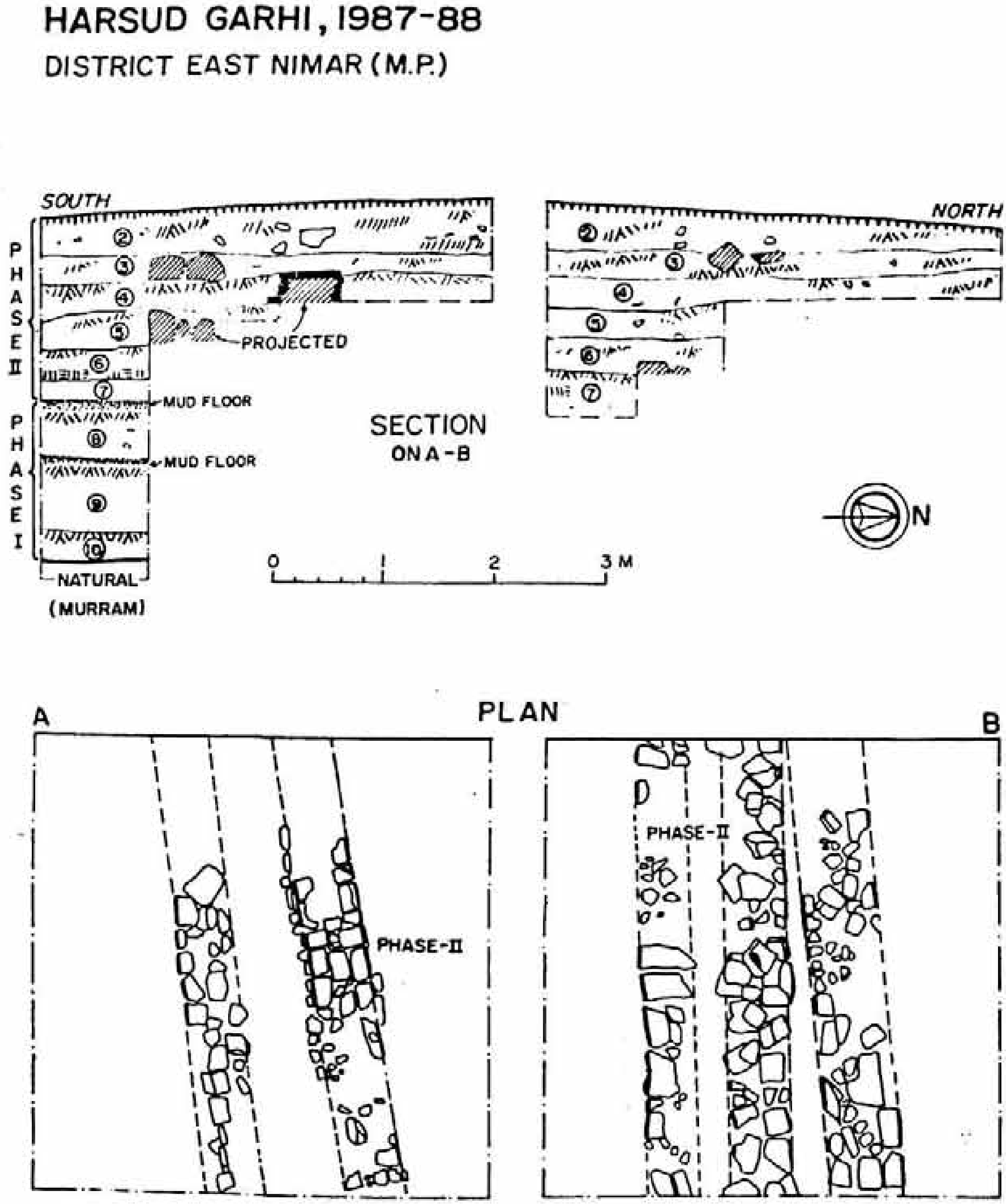

HARSUD GARHI, 1987-88
DISTRICT EAST NIMAR (M.P.)
SOUTH
NORTH
PHASE II
PHASE I
PROJECTED
MUD FLOOR
MUD FLOOR
NATURAL
(MURRAM)
SECTION
ON A-B
N
0
1
2
3 M
A
PLAN
B
PHASE-II
PHASE-II

Fig. 16

measurements of *devakosthaka* pilasters found in association with these images. Similarly, in the northern deposit abutting the exterior of *antarala,* an image of seated Bhairava (55 x 39 cm) in *lalitasana* was found along with *devakosthaka* pilasters of identical size suggesting their embellishment in *sukanasika.*

Though load bearing measures were taken into account while laying the foundation, the temple collapsed due to loose packing of reused bricks of earlier phase noted above, and rusting of iron clamps binding the decorative veneering of the temple.

The pottery recovered from the site included red ware and dark grey ware (fig. 15). The former is represented by both unslipped and slipped variety, while the latter is mostly black or with greyish black slip. The slip is dull in appearance and confined to the outer surface. The core indicated mixture of sand particles and vegetable matter. Noteworthy types are few which comprise the bowl and vase. A greyish black slip vase with out-turned rim having convex shoulder has a series of punched circles.

Important minor finds in stone included a plaque (8.1 x 5.5 cm) depicting Siva-Parvati (fig. 12.1). and balls of various sizes. Generally these balls are spherical in shape with rough to smooth finish. These balls have either been used as weights or as an item of game.

Antiquities in terracotta included a toy-cart wheel (fig. 12.6), two smoking pipes (fig. 12.4 and 7) and some beads. Among metal objects, iron in the form of nails and clamps outnumbers copper. A few copper rings (fig. 12.12) and one copper pouch of spherical shape with knobs at either end (fig. 12.11), pieces of lacquer bangles embellished with glass beads are some of the important finds from the site (fig. 12.8 and 9).

On stylistic grounds the temple may be assigned to tenth-eleventh century AD.

58. EXCAVATION AT HARSUD, DISTRICT EAST NIMAR.— Amarendra Nath of the Excavations Branch I of the Survey, assisted by S.K. Lekhwani, K.P. Rao, S. Pratapchandran, N.K.S. Sharma, Mohinder Singh, S.V. Sutaone, P.M. Bhope, H.J. Barapatre, R.K. Roy, M.U. Qureshi, R.D. Ramtakkar, A.U. Ganar and Shahid Akhtar carried out a small scale excavation at Harsud Garhi (22° 06' N; 76° 44' E), with a view to understand the cultural sequence of the site, before it is completely submerged due to the Indira Sagar Dam across Narmada.

To the north of the *mohalla* Rajagali Tekdi lies an ancient mound thickly populated which has been extensively denuded due to unscrupulous cutting of the earth for domestic use. Excavation was taken up on the western flank of the mound. However, digging was further restricted to the quadrants of the western half of the trench (fig. 16). Inspite of limited scope of the work, the stratification, as revealed, was interesting. Above the natural *murrum* were two layers 10 and 9 of brownish loose earth with red ware and occasional red polished ware, which were overlain by a mud floor capped by a layer 8 again of brownish loose earth, over which rested another mud floor sealed by layer 7. The later phase is marked by the disappearance of red polished, red-slipped and associated wares. In layers 6 to 1 coarse grey ware predominates over red ware, having common fabric of coarse type.

As has been noted above, there was hardly any occupation at the excavated site before the arrival of the red polished ware that the area in the course of exploration has yielded microliths. Tentatively red polished ware here has been ascribed to first-second century AD. Without any break in culture a

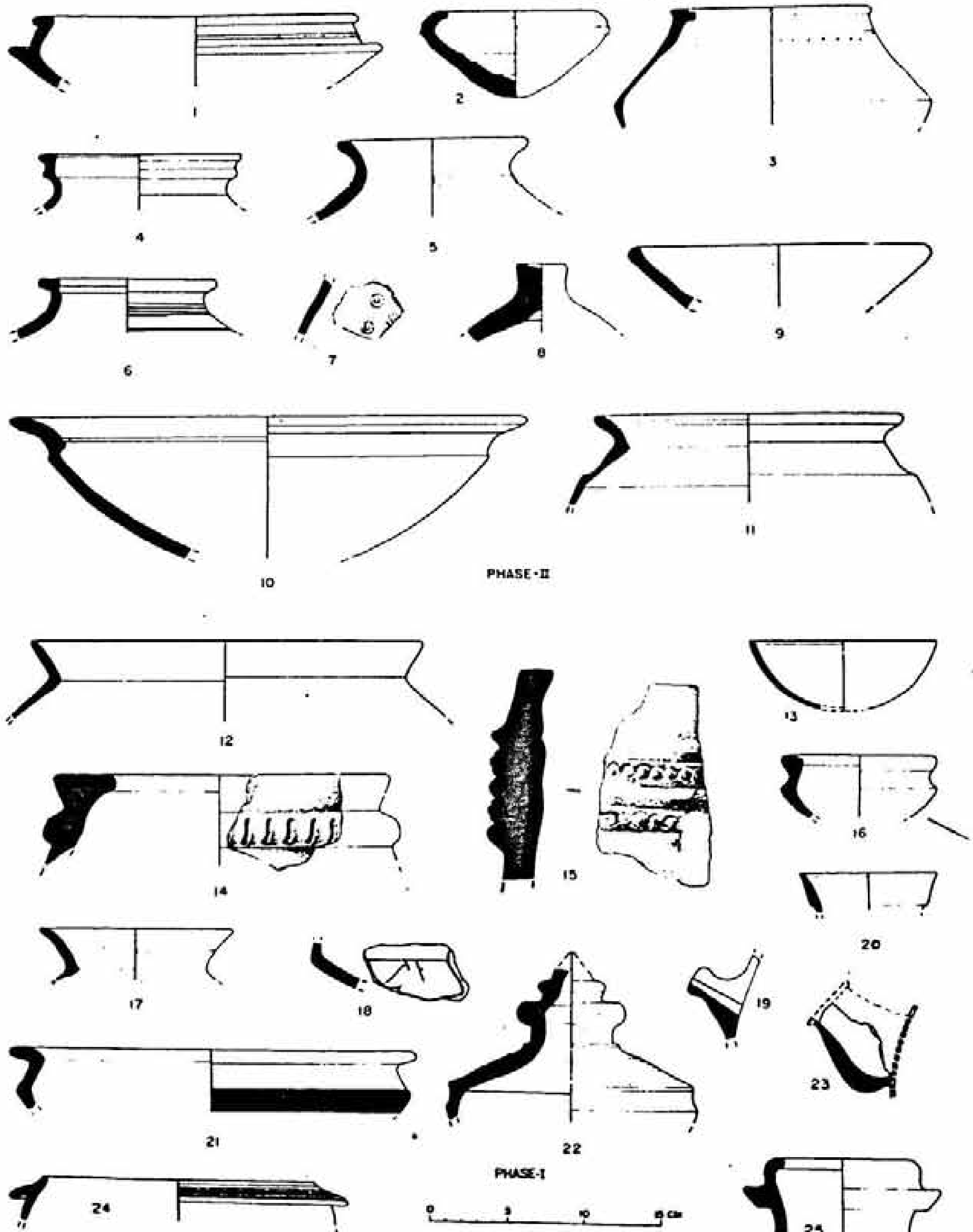


Fig. 17. *Harsud* : *1-11*, *grey ware*, *Phase II* ; *12-22 and 24-25*, *red ware and 23*, *polished ware*, *Phase I*

few pottery types of the preceding period persist in the later phase classified as medieval has yielded a coin of Shah Alam II (AD 1759-88) which should be taken as upper chronological limit of the site.

The pottery of Phase I is characterized by red polished ware and associated red ware of thin and medium thick fabric with red slip but devoid of any further decorative treatment. The types met with are fragments of spouted vessel, bowl, carinated *handi,* dish, lid, storage jar, etc. A typical fragment of spout with lustrous red polish and a wide-mouthed red ware fragment of a bowl internally bevelled at the rim thereby producing a knife-edge, are some of the important sherds to mention. Fragments of micaceous red ware having chocolate painting immediately below the carination of the *handi* is typical to the site. One specimen of miniature pot apparently turned on slow wheel is subjected to palm tapping to receive a globular shape. Another variant type met with is fragment of a medium-sized jar with a featureless splayed-out rim on a carinated inner neck, haying coarse to medium fabric with dull-red-slip. The black burnished ware, present in lesser frequency, has a specimen of carinated *handi* with externally grooved splayed-out rim. A micaceous red ware sherd of bowl with groove ledge and a fragment of drab ware with graffiti marks are some of the important specimen in bowl. Mention may also be made of fragments of storage jar with thick crude ill-burnt fabric having a red wash on both sides. The exterior neck portion is further decorated in concentric line with stamped impression of circle in between parallel ribbed lines. Another fragment of storage jar in red ware having a thick rim, flattened at the top with sharp taper at the neck distinguished by an applied notch design at regular intervals (fig. 17).

The pottery of Phase II is distinguished by the darkish-grey ware and little of red ware, both coarse in fabric and poor in treatment. The slip is mostly on the outside and is occasionally varnished. The shapes met with include bowl, lid-cum-bowl, carinated *handi,* basin and bulbous jar. Among decorated sherds reference may be made of a group of stamped circles appearing frequently on the exterior of the vessel from medieval levels of other sites in this region like Chandel and Kashipura with some variations. This motif appears like sun-motif. A lid fragment in sturdy grey ware with a central knob externally of button shape gives a rough fracture due to ill-levigation and presence of foreign material. This type of lid is common in other medieval sites reported elsewhere in this region.

In Phase I structures in the form of mud floors were found whereas in Phase II structures of random rubble and burnt bricks are noticed. Nothing in the form of antiquity from lower phase is encountered, however, a much corroded copper coin and a terracotta mould of an ornament (?) picked up from the unstratified cutting at the site, may be classified under this phase. Besides a copper coin noted above, terracotta beads, shell bangle fragment, stone balls and highly rusted pointed iron axe, iron chisel and iron nails were also unearthed in the upper phase.

59. EXCAVATION AT SARASWATI KUNDA, DISTRICT EAST NIMAR.—Amarendra Nath of the Excavations Branch I of the Survey, assisted by S.K. Lekhwani, K.P. Rao, S. Pratapchandran, N.K.S. Sharma, Mohinder Singh, S.V. Sutaone, P.M. Bhope, H.J. Barapatre. R.K. Roy. M.U. Qureshi, R.D. Ramtakkar, A.U. Ganar and Shahid Akhtar, carried out small scale excavation with a view to know the cultural sequence of the Saraswati Kunda complex, before it is completely submerged due to the Indira Sagar dam across the Narmada. The site is situated on the southern outskirt of Harsud town,

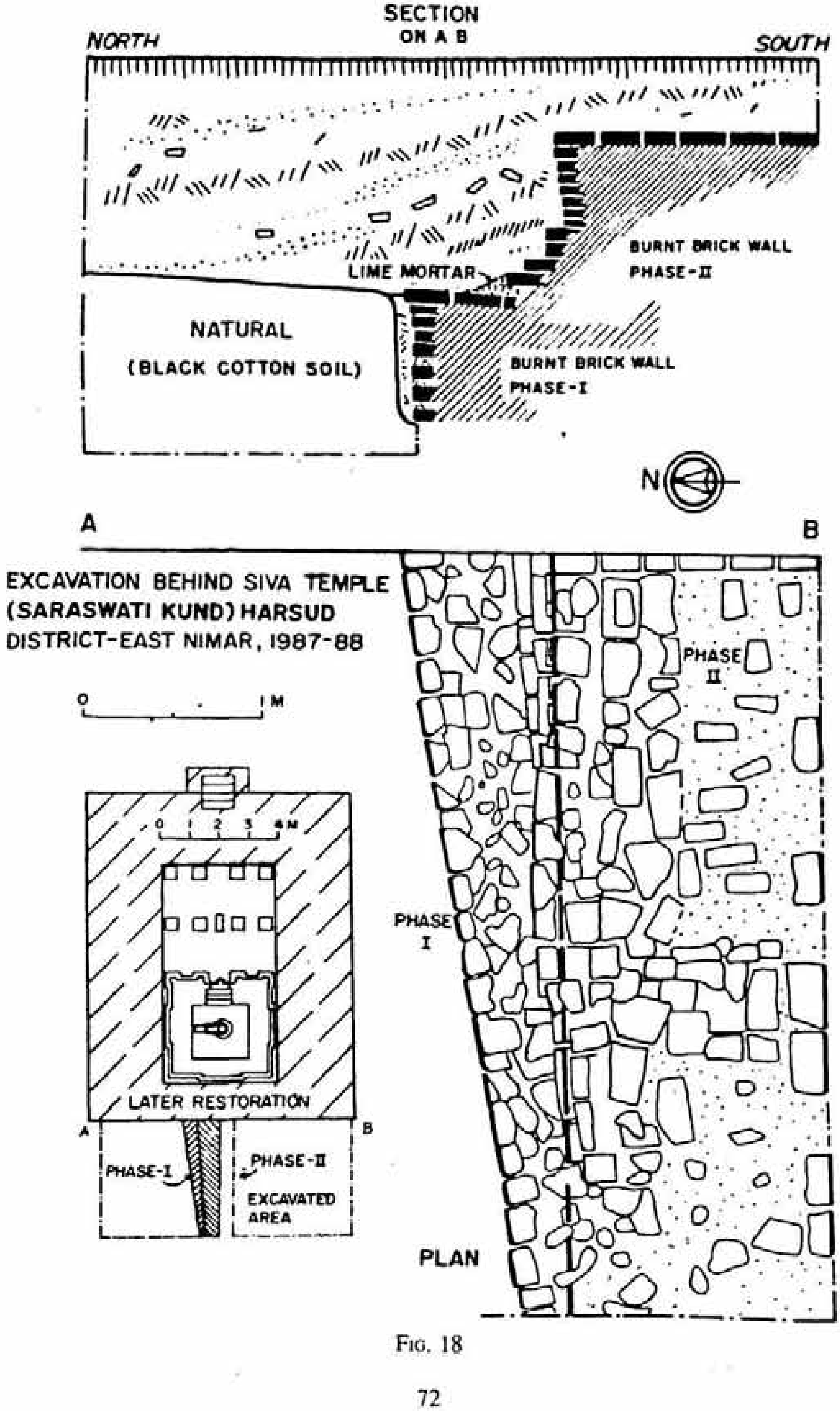

SECTION
ON A B
NORTH
SOUTH
LIME MORTAR
BURNT BRICK WALL
PHASE-II
NATURAL
(BLACK COTTON SOIL)
BURNT BRICK WALL
PHASE-I
N
A
B
EXCAVATION BEHIND SIVA TEMPLE
(SARASWATI KUND) HARSUD
DISTRICT-EAST NIMAR, 1987-88
0
1 M
0 1 2 3 4M
LATER RESTORATION
PHASE-I
PHASE-II
EXCAVATED
AREA
PHASE
II
PHASE
I
PLAN

FIG. 18

a taluk headquarter. In the vicinity, several stone sculptures of early to late medieval period, both of Brahmanical and Jaina pantheons, have been reported. Some of the exemplary antiquities are now in a private collection of Ram Gopal Sharma 'Yogi', owner of a restaurant in Harsud.

Behind the living temple of Siva, on the western side, abutting the later restored *pradakshina-patha,* an area of 10 x 10 m was laid out for excavation, however, the excavation was further restricted to the quadrants of the eastern half of the trench. The encroachment due to the restoration of *pradakshina-patha* and later disturbances at the site remained a bottle-neck in determining a relative chronology of the temple *vis-a-vis* structural evidences unearthed in the excavation. Due to these later activities no stratified layers could be noticed. Nevertheless, burnt brick structures of two different phases, superimposed, oriented east-west, could be recorded (fig. 18). Structure of Phase I rests over black cotton soil and has a distinct foundation pit-sunk in the natural soil. The eight courses laid in mud mortar in the foundation do not maintain the plumb-line and some voids are also noticed in it between the laying of three lower courses at the base. The eastern arm of these structures extend below the foundation of later restored *pradakshina-patha,* whereas the western arm of the upper structure is extensively robbed. It appears that during the building activity of Phase II the lower structure was levelled up and the top of it was used as a strong base for the structure of later phase. Traces of lime mortar can be seen below the basal course of brick structure of Phase II. Out of twelve courses exposed of the structure of upper phase, four lower courses are laid in offset, remaining eight, supposedly straight, are now out-of-plumb due to pressure in the core. The maximum width of the wall noted is 1.45 m and the brick sizes varied from 37 x 22 x 6 cm to 32 x 22 x 6 cm.

The living Siva temple oriented east-west, standing over these structural remains, has on plan a *triratha* sanctum followed by an eight-pillared *mandapa.* From the excavated area, other than a sculptured fragment of right portion of bigger image depicting a dancing figure no antiquarian remains have been found. However, within the Saraswati Kunda complex from an unstratified deposit some moulded bricks and a terracotta plaque depicting *makara-mukha* (fig. 12.3), perhaps pan of an architectural decor, has been picked up. Likewise, two standing images of Vishnu, are seen restored to the southern wall of the Saraswati Kunda. From left to right these sculptures may further be classified as Vishnu in Narayana (75 x 40 cm) and Sridhara forms. The former stands in *samabhanga* on a *pancharatha* pedestal and accompanied by Sankhapurusha on the right and a Chakrapurusha on the left (pl. XXVI A). He is adorned with *kirita-mukuta,* beaded *patra-kundalas, vana-mala, graiveyaka* and other usual ornaments. He holds *sankha* in the lower right hand and *chakra* in lower left hand whereas the upper right hand holds *padma* and the left hand holds *gada.* Equally interesting is the Sridhara form of Vishnu image wherein he is crowned by a *karanda-mukuta* instead of usual *kirita.* In this image the order of distribution of attributes is different than the one described above. Here he holds in the upper two hands *chakra* and *gada* whereas the lower two hands display *akshamala* and *sankha* (pl. XXVI B). Between these two images, an architectural fragment is seen embedded in the wall of the *kunda.* It depicts two seated images of Lakshmi in a projected balcony, separately, one above the other in *lalitasana* holding *chakra* and *gada* as attributes. Another architectural fragment (86 x 23.5 cm) depicts in two vertical pilastered frames, images of Surya one above the other, the lower one standing in *samabhanga* whereas upper one is squatting with knees apart (pl. XXVI C).

60. EXCAVATION AND EXPLORATIONS IN DISTRICT NARSINGHPUR.—In continuation of last year's work (*1986-87,* pp. 50-54) a team comprising V.N. Mishra, S.N. Rajaguru, G.L. Badam, R.K. Ganjoo, R. Korisettar and V.G. Sathe from the Deccan College, Postgraduate and Research Institute, Pune, carried out further excavation at the palaeolithic site at Samnapur, and geological and palaeontologi-cal investigations around Devakachar, Samnapur and Burman Ghat in the Narmada valley.

The site is situated on the right banks of the Narmada and the Richai-nala, the latter originating in the Vindhya hills and draining into the Narmada. It is located at the foot of a cherty quartzite outcrop of the Vindhya hills, about 1 km north-west of the present Narmada, 1 km north-east of Gokula village (23° 04' 45"; 79°$_r$60' 55") and 1.5 km west-south-west of Samnapur village (23° 06' 17"; 79° 07' 30").

The site is located on the high (23 m) alluvial terrace of the Narmada. The fine silty-clayey alluvium has been much dissected by erosion, producing a typical badland topography. The site occurs in the form of a rubble spread on a hummock which is bound on the west and south by narrow gullies and on the east by a wide *nala.* The rubble can be traced over a length of about 80 m in a west-north-west direction towards the hill slope. Both the alluvial surface and the nearby hill are covered by dry deciduous vegetation which is being rapidly cleared for cultivation right up to the edge of the hill.

The archaeological horizon is buried in the alluvium and has been partly exposed by erosion. The maximum thickness of the alluvium above the Narmada water level is about 23 m near the edge of the river. The height of the archaeological horizon above the river level is only 10 m, suggesting that some 13 m of silt cover over the site has been stripped away since it got originally sealed under the silt. The archaeological horizon slopes towards the western gully where erosion has exposed artefacts on the surface, and some of them have slid down into the gully. However, on the other three sides it is still covered by silt, and the thickness of which progressively increases towards the east. The maximum exposed slit cover, on the eastern side is 1.36 m, but it will further increase if the trench is extended on this side.

Last year's trench of 4 x 4 m was enlarged by 3 m along the E-W axis and by 5 m along the N-S axis. It was divided into 1 m broad segments which were named I to M from north to south. The 1 m square units in each segment were named in Arabic numerals from east to west. Seven squares were exposed in each of I to K. segments while only five squares each were dug in L and M segments, the total excavated area being 31 sq. m. The digging was done to a depth of 35 cm, and the record of finds was maintained squarewise and in spits of 10.15 cm. The archaeological horizon occurs in a rubble gravel sandwitched between silt deposits. The rubble, composed predominantly of blocks of cherty quartzite and chert, is of a remarkably uniform nature. The size of the blocks ranges between 20 and 3 cm, the average being about 8 cm.

The artefacts were found throughout the excavated area though the density pattern varied. The density of both blocks and artefacts was more in squares 2-5 of all segments. Square I of segments L and M was almost completely devoid of blocks and artefacts. In all peripheral squares on the eastern, northern and southern sides the concentration of blocks and artefacts was along the adjoining squares. In other words, the concentration of both blocks and artefacts was in the central part of the

trench, roughly in an area of about 20 sq. m. The density of artefacts increases with the depth, the total number of artefacts in the three levels dug being 194, 291 and 474, respectively.

The artefacts are remarkably fresh, suggesting minimal dislocation from their original locale of manufacture, use and discard. The raw material used is primarily cherty quartzite available as blocks and cobbles on the slope of nearby hill. However, other rocks like Vindhyan quartzite, dolerite, chert and rarely chalcedony have also been used. Vindhyan quartzite and dolerite are exotic to the site, and their nearest source is about 10 km away. Chert and chalcedony are available on the nearby hill within the cherty quartzite.

The assemblage of 676 artefacts recovered from the excavation comprises shaped tools (177; 26.18%), modified artefacts (13; 1.92%) and debitage (486; 71.89%). Among the shaped tools scrapers of various types (167) account for nearly 94.35% pieces. Other types in the shaped category are cleaver (1), chopper (1), knife (1) and notch (7). Sub-types in the scraper class are side (103), end (31), side-and-end (17), round (6) and double-side (10). The modified artefact class comprises only 13 retouched flakes. In the debitage category there are 248 (51.02%) flakes, 2 (0.41%) blades, 145 (29.83%) cores, 40 (8.23%) chips, 47 (9.67%) worked nodules/chunks and 4 (0.82%) hammerstones (pl. XXVII).

Almost all the shaped tools are made on flakes. The retouch is bold, mostly unifacial and restricted to the edge of the margins. Cortex is preserved on the dorsal surface of most of the artefacts. Many of the unretouched flakes, particularly massive and heavy ones, show use marks and edge damage. Predominantly, the assemblage consists of an amorphous flake element with a heavy duty component adapted to woodland environment involving considerable wood-working and manipulation of forested landscape. The assemblage appears to be a variant of the Middle Palaeolithic.

A few isolated dental remains of *Bos* sp. found in association with artefacts.

The rubble containing the archaeological material occurs as a thin lense in a silt deposit. The position of the silt in the local alluvial stratigraphy is as follows (from top to bottom):

Lithological unit	*Approximate thickness*
Yellowish brown silt with a lense of cherty quartzite rubble with fresh Middle Palaeolithic tools	8 - 13 m
grades to	
Light reddish brown silt with a lenticular patch of pebble gravel	2 m
Reddish brown silt with intercalated bed of cobbly pebbly gravel containing fresh and abraded Acheulian tools	6 - 8 m

The basal reddish silt represents a flood plain of the ancient Narmada which was flowing 5-6 m below the present course. The tributaries like the Richal *nala* had a steeper gradient and were occasionally contributing coarser cobbly pebbly gravels during strong floods. On the other hand, the overlying yellowish brown silt represents the flood plain of the Narmada and its tributaries when the Narmada was flowing a few metres above the present bed level. The rubble under study was deposited in the very early phase of the aggrading and widely meandering Narmada. The several metres thick

silt cover over the rubble indicated frequent occurrence of low energy floods in the rapidly aggrading Narmada.

The rubble has originated as colluvial sheetwash from the nearby hill range. Artefacts occur over the entire exposed extent and to a depth of 40 cm of the rubble. The hominid groups probably took advantage of the easily available raw material for making their tools. The closeness of the perennial Narmada afforded accessibility to water as well as game. The alluvial surface containing the rubble was not subject to inundation by the annual Narmada floods. The close by hills afforded further refuge from the floods and also provided ample source of plant and animal foods as well as varied raw material for tool making. The fairly uniform distribution of artefacts, both horizontally and vertically, as also the freshness of majority of the artefacts preclude any long distance transport of the archaeological material. The presence of both finished tools and debitage is suggestive of local manufacture of most of the artefacts. However, considering the fact colluvial processes were in operation when the hominids occupied the landscape, certain amount of intrusion of archaeological material from the immediate vicinity may not be ruled out.

In the context of the known stratigraphy of the central Narmada basin the Middle Palaeolithic horizon can be dated to the later part of the late Pleistocene. The climate during this period was relatively dry. The existing entrenched courses of the Narmada and its tributaries are the results of a relatively humid phase of the early Holocene. The eroded alluvial landscape around the site is a consequence of the tributaries adjusting to the mainstream.

Palaeontological investigations for recovering animal fossils were also carried out at Belghat, 2 km east of Devakachar on the left bank of the river Sher, Kondra field near Umaria village, 2 km north of Devakachar, and Barman Ghat, 30 km northwest of Narsinghpur. Postcranial bones and teeth of bovids were collected from unstratified context in the gullies at Belghat.

In the Kondra field fossils of bovids, carnivores and elephants were collected along with bivalve molluscan shells.

At Barman Ghat a rich fossiliferous site was located on the right bank of the Narmada just behind the PWD Rest House. An almost complete bovid skeleton was found *in situ* in reddish yellow silt of the Upper Group. A few astragalus and horn core fragments were recovered from the base of the sandy pebbly gravel below reddish yellow silt. A large skull, one complete and one incomplete horn core, two jaws, hip and shoulder girdles, ten vertebrae and some long bone fragments were retrieved from the yellow silt.

61. EXCAVATION AT ERAN, DISTRICT SAGAR.—Dr Harisingh Gour Vishwavidyalaya, Sagar, resumed excavations at Eran under V.D Jha assisted by S.R. Dubey, K.K. Tripathi, Mohar Khan, N.P. Dubey and P.K. Shukla. The main objectives of the season's work was to determine the sequence of Neolithic, Kayatha and Chalcolithic cultures; to determine the exact relationship between the neolithic and chalcolithic people; and to investigate the deposits of Harappan culture.

Two trenches, ERN-4 and ERN-5 were laid on different mounds. ERN 4, has the maximum habitational deposition of 7.70 metres whereas in ERN 5 the height is 3.55 metres. ERN 4, containing 200 metre thick protohistoric deposition revealed significant facts. The lowest deposition yielded

painted black-and-red and Malwa wares. It was observed that the Ahar culture preceded the Kayatha culture. The interesting revelation is that the earliest occupants used triangular cake-like object of terracotta, stone weight and buff ware as well.

Period I A: The ceramic industry of this phase included white painted Black-and-red, Malwa, fine black-and-grey and coarse black wares. Few grey ware, white-slipped ware, tan ware and buff ware sherds were also noticed. A few coarse grey ware sherds have paintings in chocolate colour.

The 98 cm thick deposit yielded sling ball, weight, thick disc and pestle of stone; bull figurine, triangular cake-like object, perforated and unperforated disc and marble of terracotta; bone point; beads of stone, terracotta and paste; stone blades, crescents and waste flakes. The number of stone tool is relatively less. It may be mentioned that at Azadnagar also Malwa ware preceded Kayatha ware. But at Azadnagar no evidence of Ahar culture was noticed in the pre-Kayatha phase.

The black-and-red ware at Eran is painted in white on the exterior only. Row of dots, ladder, vertical bunds and harp-like motifs are executed with a bold brush. The fabric of painted black-and-red is medium coarse. Punctured triangular motif were also noticed in a few thick black ware sherds. Fine black-and-grey ware has resemblance with Malwa in fabric.

Three structural phases encountered in the form of rammed floor of yellow or black clay mixed with pottery, brick bats and terracotta nodules. One of the floors was littered with animal bones and charcoal. Hearth with animal bones and ash also noticed in one of the floors.

Period I B: A 92 cm thick deposit of this phase is marked by the introduction of Kayatha lustrous red, handmade thick black shining ware, black ware and incised ware. There is no evidence of painted black-and-red, black-and-grey, white-slipped and coarse black wares of the preceding phase but the Malwa ware and Tan ware continued. Dish-on-stand and channel spouted bowls occur in Malwa ware. Two sherds of black ware bearing painting executed in white were noticed. Grey ware and coarse red ware do occur. Burnt chunk of clay with bamboo impression indicated that huts were made of wattle-and-daub. About 30 cm wide plinth of boulders, broken burnt bricks and pieces of thick jar was noticed. Two rammed floors were encountered. Parallel sided, truncated, tanged stone blades, pestle and quern of stone; terracotta figurine of mother goddess, humped bull, disc, dabber, puley-shaped earstud; copper spearhead; stone, terracotta and paste beads; point and stopper in bone are the notable finds. Large number of both charred and uncharred bones of fauna suggest that the people were consuming meat. There is no evidence of iron in this phase but, rough neolithic celt and a ground hammer stone were found.

Period II: No gap between Period I and II exhibits the peaceful migration of iron-using people of the latter period. Period II was distinguished by the introduction of iron, NBP, black burnished ware and punch-marked coin. Grey ware, Malwa ware and Black-and-red ware of the preceding period are conspicuous by their absence. The black-and-red ware of this period differs from that of Period I in shape and fabric. Burnt brick structures and rammed floors were noticed. Four post-holes were encountered on one of the floors.

Notable finds included copper ring, pin, and miniature pot; spearhead, chisel, arrowhead, small broken sword and dagger of iron; bull figurine, disc, toycart wheel, marble gamesman, earstud and skin rubber of terracotta; round hammer stone, quern, pestle, unfinished horse figurine; bone point;

shell bangle; and beads of terracotta, stone and shell. Period II can be dated between *circa* 700 BC to first century AD.

Period III: The ceramic industry included red polished ware and other associated wares. NBP is absent. Coins of Ramagupta and rulers of the Naga dynasty were found. A broken image of *tirthankara* is the first Jaina icon unearthed so far at Eran. Human figurine and other household objects of terracotta; spearhead; chisel and nails of iron; stone marble and bead; and shell and glass bangles were also encountered. Burnt brick structures had the roof of tiles. Ring wells were also noticed. This period is assignable between first century AD and sixth century AD.

Period IV: Evidence of destruction in Period III by fire and invasion has been met with in excavation. The site was abandoned after sixth century AD and reoccupied sometime during fourteenth century AD. The cultural material of late medieval period included copper ring, hairpin; iron arrowhead, knife and nail, spherical ball of lead; miniature pot of soap stone; and bead and marble of terracotta.

No evidence of Neolithic culture, excepting a rough celt and ground hammer stone has been met with. It seems that the neolithic deposit was restricted to one of the outer mounds. Of ten stone celts, five have been encountered from excavation and the remaining have been collected from the surface.

62. EXCAVATION IN THE MAIHAR AREA, DISTRICT SATNA.—J.N. Pandey and J.N. Pal of the Department of Ancient History, Culture and Archaeology, University of Allahabad resumed exploration and excavation in the Maihar area of the District Satna with the assistance of H.N. Kar, L.K. Tewari, V.N. Rai, Rajendra Prasad, V.K. Khattri, D.K. Shukla, M.C. Gupta, Arvind Malviya and Kishori Lal. The Acheulian site of Maihar I was further excavated. The Middle Palaeolithic site at Maihar II and III and the late Upper Palaeolithic site at Maihar IV were also selected for excavation. Besides, the river section of the Lilzi was mapped with a view to understanding relative levels of the Acheulian occupation and the Gravel I of the river section containing rich Acheulian artefacts some almost in mint condition. The horizon of the Gravel I was 17 m below the occupation site.

As stated above the excavation at Maihar I was continued and the index squares, SB-1 and SC-1 which could not be fully exposed were taken up upto maximum depth of 1.73 cm and layer 3 and 3A the artefacts-bearing layers were fully excavated.

Layer 3A in the index squares is composed of yellowish clay containing shale fragments and unrolled stone blocks. It yielded mint fresh artefacts. Layer 3 is characterized by whitish clay containing shale fragments and very fresh artefacts. Layer 3 and 3A are dipping southward indicating slope in that direction during the Acheulian period. Surprisingly enough, at present the slope is northward. In the index squares most of the artefacts were fashioned on quartzite whereas in other areas sandstone was also used in a good quantity for manufacturing the artefacts. The artefacts recovered from these squares included flakes, cores, handaxes and cleavers. A round flat stone disc with alternate flake scars on the periphery is a significant discovery. It might have been used as game object.

For understanding the activities of Acheulian people some more areas were exposed horizontally. A 5 x 5 m square area in close proximity of the Index square and divisible into squares A-l to

A-5, B-l to B-5, C-l to C-5, D-l to D-5 and E-l to E-5 was selected and excavated upto a depth of 89 cm. Layer 3, the artefact-bearing horizon measured 25 cm in thickness. The excavation exposed fresh artefacts, mint-fresh big and small flakes and unrolled stone blocks.

Two trenches measuring 5 x 5 m each were also laid out in the south-east corner of the gridded area for excavation. One trench divided into squares A-31 to A-35, B-31 to B-35, C-31 to C-35 , D-31 to D-35 and E-31 to E-35 was excavated upto a depth of 72 cm divisible into three layers. The layer 3 with a thickness of 30 cm yielded Acheulian artefacts in primary context. One of the important features of this area was a semi-circular enclosure made by big sized stone blocks. Some stone with flat top measuring about 1 m in length, 65 cm in width were possibly used as platform for sitting while the round boulders with pitted surface were used as anvils. One of such stones measured 44 x 38 cm. A few such boulders have flake scars, indicating that these were used as cores also. The available evidence suggests that the enclosed area was possibly used for living purposes. Some small retouched flakes were also found from this enclosed area.

The excavation in squares G-31 to G-35, H-31 to H-35,1-31 to 1-35, J-31 to J-35 and K-31 to K-35 was also conducted upto a depth of 72 cm and big sized stone blocks as those of squares of A-31 series were exposed. The artefacts in these areas include scrapers, cleavers, handaxes, polyhedron and discoids in addition to cores and flakes.

The Middle Palaeolithic site of Maihar II is located to the south of Maihar I. It is about 43 cm above Maihar I. Artefacts made of fine-grained dark reddish and blackish quartzite were scattered at the site which is partly disturbed by ploughing. In the undisturbed area a square of 5 x 5 m was gridded into 1 x 1 sq. m unit for plotting the artefacts. A few artefacts made on chert and chalcedony were also found on the surface. The artefacts included flakes, flake fragments, chunks, discoid cores, cores, scrapers, retouched flakes, blade fragments and a few cleavers. Though due to the exposed nature of the area, tools of different facies of stone culture such as Upper Palaeolithic and Mesolithic have also been found, the major assemblage pertains to the Middle Palaeolithic period.

As was the case with Maihar II the site of Maihar III also belongs to the Middle Palaeolithic age. Here also 5 x 5 m area was gridded in 1 x 1 m squares for plotting the artefacts. It is 50 cm below the main datum that is Maihar I. After plotting the artefacts scattered on the surface a 3 x 3 m area was excavated to a depth of 62 cm below datum. The excavation revealed about 20 cm thick reddish loamy deposit covering the Middle Palaeolithic artefacts laying on the weathered surface of shale, and the excavation revealed that the artefacts on the present surface were not *in situ,* but these seem to have shifted from the elevated area lying to the east. But the artefacts on top of weathered shale in excavated squares are found *in situ.* The lithic assemblage as those of Maihar II included cores, discoids, scrapers, flakes, retouched flakes and chunks made of fine grained dark blackish quartzite.

The site of Maihar IV is located on the left bank of a meander of river Lilzi. The surface of the site is littered with artefacts made of chert, chalcedony and quartzite. An area of 20 x 17 m having concentration of artefacts was gridded in 1 x 1 m squares for plotting the artefacts to know nature of distribution and 5 x 4 m area in the centre of the site comprising squares K-9 to K-13, L-9 to L-13, M-9 to M-13, and N-9 to N-13 was selected for excavation in addition to K-8. These squares yielded 15 cm thick deposit above the weathered shale (bed-rock) divisible into two layers, Layer 1 with a

thickness of about 5 cm is composed of fine reddish soil. The layer 2 with a thickness of about 7 cm has a very rich concentration of artefacts. The artefacts included big sized cores, blades, flakes and finished tools comprising retouched blades, backed-blades, truncated-blades, scalene triangles, scrappers, drills, etc. Majority of the artefacts are made of chert, some of the tools have also been made on chalcedony and dark blackish or reddish quartzite.

To sum up, the excavations conducted at Maihar this year confirmed that there is a rich concentration of the Acheulian artefacts at the site with the evidence of enclosure in the working areas that the area was constantly visited by the stone age man right from the Lower Palaeolithic to Mesolithic; and during the Lower Palaeolithic period there was slope southward, though at present the direction of the slope is reversed; that the available evidence suggests that in Maihar area, there are primary sites not only with reference to Lower Palaeolithic period but with reference to Middle Palaeolithic, Upper Palaeolithic and Mesolithic periods as well.

63. EXCAVATION AT NADNER, TEHSIL BUDHNI, DISTRICT SEHORE.—In continuation of last season's work *(1986-87,* pp. 56-58) the Prachya Niketan, Centre of Advanced Studies in Indology and Museology, affiliated to Bhopal University, Bhopal under the direction of C.B. Trivedi, assisted by Sudhakar Nath Mishra, resumed excavations at NDR-3 across the edge of the mound in the eastern section with the purpose to know the nature of the defence wall and the moat. The excavations confirmed the last year's chronology from Period II to Period V.

Period II *(circa* 700 - 500 BC): The ceramics of this period were analogous to that of the last year, found in the corresponding periods. Antiquities found included beads, gamesman and terracotta flesh rubbers.

Period III *(circa* 500 - 300 BC): This period coincides with Period III A and III B of the last year and is marked by grand scale conflagration. It is marked by the presence of NBP along with pottery of the previous period and Ahichchhatra X. type *handis* and punch-marked copper coins.

Antiquities included terracotta fine burnt red-slipped head-scratchers with *nandipada* symbols; copper ring, wire, coils, antimony rods; beads of semiprecious stones of various shapes including etched beads; tortoise stone pendant showing incisions, all over the body with a hole; iron arrowheads, nails, knives, etc.

The presence of rammed floor, large number of roof-tiles with deep finger impressions, some with perforations depicted intensive architectural activity noticed in the corresponding period in the last year's excavation.

Period IV *(circa* 300 - 200 BC): This period is dominated by drab red ware, black-and-red ware, black-slipped ware. Types are of utilitarian type such as *handis,* sharpened rim bowls, dishes and vases. Other objects were gamesmen, terracotta and semiprecious stone beads, discs, lobe-extender, terracotta amulets and shell bangles.

Like previous period, the structural activity are confined to beaten floor; walls of clay with bamboo and reed impressions. Coins bearing the legend *Bhagilaya* in third century BC Brahmi characters and *Kururaya* in second century BC characters were also found.

Period V {*circa* 200 BC - AD 200): The ceramics of this period were bowls, high necked vases, *handis,* degenerated black-and-red and black-slipped sherds though in restricted number.

Antiquities of this period included gamesman, beads, pendants, crucible, terracotta toys, stone casket, legged quems of red sandstone, iron arrowheads, amulets of bones and bangles, copper beads, etc. Besides, copper punch-marked coins and Satavahana coins were also found.

Among the structures mention may be made of a drain of baked bricks (23-5 x 23-5 x 9-5 cm), marked by finger impressions running north-west to south-west.

MAHARASHTRA

64. EXPLORATION IN DISTRICT AHMEDNAGAR.—In the course of village to village survey, S.S. Parekh of the Aurangabad Circle of the Survey noticed antiquarian remains at the following sites:

Taluk	*Village/Site*	*Nature of remains*
Sanganmer	Kauthe Kamaleshwar	Late medieval Siva temple, image of Lakshmi-Narayana
-do--do--	Kokargaon	Late medieval Siva temple, known as Nirjareshwar built by Sardar of Bajirao II
do-	Konchi	Fortification wall with two bastions, ruined Jondhale's building
-do--do-	Lohare	Two residential buildings of the late medieval period i.e. Sonarwada Patilwada
-do-	Nannaj	Remains of gateways and temple dedicated to Martand-Bhairava
-do--do-	Nimgaon-Jag	Residential building of Trimbak Dhengale Sardar of Bajirao I, stepped well, Jondhale's residential building
	Nimon	Late medieval residential building, remains of gateways, Nandi in front of the Siva temple, potsherds and microliths
-do-	Rajapur Vadgaon (Pan)	Late medieval residential building
	Valhe	Residential building of Prataprao More, Siva temple with an inscription, Kanifnath temple, temple of Vithoba with an inscription built in Saka era 1695 (AD 1773) by Abaji Sonar Remains of fortification wail and gateways

Besides, M. Mahadevaiah of the same Circle also noticed a ruined Hemadpanti temple (thirteenth-fourteenth century) and four sar/-stones (sixteenth-seventeenth century) from Jategaon village in the Jamkhed Taluk.

65. EXPLORATION IN DISTRICT AMRAVATI.—Ajit Kumar of the Aurangabad Circle of the Survey during the course of exploration in the submergence area of Shahanoor river project in Taluk Achalpur/Ellichpur reported the discovery of a mound yielding early historical and medieval pottery in the village of Morgad and Wadgaon. Pottery was represented by coarse red ware, burnished red-slipped ware, coarse grey ware and sherds of black and red ware.

In the submergence area of Chargad and Purna river projects both situated in Tehsil Chandur Bazar he also noticed chalcolithic (?) as well as early historic pottery from a huge mound at village Parsoda. The ceramic industry was represented by burnished red ware, coarse red ware, micacious red ware. The shapes were vases and dishes. The rims of the bases have incised concentric lines in majority of the cases. From the village Surli situated in submergence area of Purna project he also collected microliths, comprising of fluted cores, blades, bladelets in chalcedony and a few flake tools like scrapers in chert.

66. EXCAVATIONS AT DAULATABAD, DISTRICT AURANGABAD.— P.N. Kamble, assisted by S.K. Joshi, M.R. Dhekane, Ajit Kumar, M.Mahadevaiah, S.L. Jadhav, D.N. Sinha, D.T. Asar, D.L. Sirdeshpande, R.D. Ingle and G.L. Gaikwad of the Aurangabad Circle of the Survey carried out excavation at Daulatabad with the aim to find out the exact living pattern of the people of the transition period in the thirteenth-fourteenth centuries.

The area, locally called 'High Mound', with the coverage of as many as 44 trenches (each 5 m x 5 m) that were tapped horizontally did yield conspicuously variety of structures that were awesome, from mud plastering to fine lime-plaster, from normal ground working level to the higher working floors with flight of steps, from open drainage-system to concealed pattern, from natural open air toilets to the toilets of privacy and sanitation, from normal domestic life to the busy and din administrative apartmental environments, from trabeate system of roofing to arcuate system.

The living pattern in regard to settlements of living apartments is gradually seen through the uncovered structures here that it rises from simplicity to complexity, from poverty to riches and from diversity to unity. The socio-economic life as seen here through the finds of antiquities and structures are cordial, integrated and harmonious, with the patterns of the two different ways of life existing side by side. A Hindu house with all its grace and traditional ritualistic approach to life, is a living symbol by the side of a Muslim house with non-ritualistic approach to worship and effective equality of social standard.

While the trench B-8, C-7 and C-8 on the western fringe have yielded the house of a Muslim pattern with curtain wall for privacy at the entrance, the bath and toilets at a distant apart, uncovering forth iron rings, tavis, dishes and thick jar pieces. The trench on the middle portion namely C-15 has yielded evidence of a simple domestic local way of life with grinding stones, *chandan* pestle stone and an open door direct to the lane without any curtain walls.

The trenches on the south, C-15, D-15, E-15, C-16, D-16, E-16, F-16, C-17, D-17, E-17 and F-17 have thrown light on elegant pattern in planning of a house complex of an affluent person. This constructional complex activity is more than a mere locale, it is a symbol of Indian way of life, her culture and religious traditions.

This complex-house, with its orderly planning, superb execution and finish through ashlar masonry, though all in ruins, with frontal paved courtyard, has a huge drawing hall (sitting room or congregation hall) with cupboards in the walls, cells, and doors fairly wide to the rooms flanked on either side; also it has a kitchen room fairly big on its west with *devakoshtha,* hearths, *chandan* stone pestle, huge storage jars embedded in the south-west and south-east corners, earthen lamps for worshipping, a small *brindavan (Tulasi Kund).* It, therefore, reflects an infinite variety which has passed through an essential process of evolution bringing about changes in its form, design, architecture and even concept of local needs.

The trench F-14 and F-15 have yielded a pattern of structural evidence which symbolizes the class and bureacracy of its owner, who must have occupied a fairly high position in the society. This house, not only has made a big exposure on its dimensional hall and ancillary rooms with lime-plastered walls but also has a majestic stairway to lead to either upper storey or to cross over to the next ancillary building. Here in the walls, cupboard-like cuttings with well plastered surfaces were noticed. Also sufficient copper coins (both of Indo-Islamic and Hindu rulers), a sword, etc., were discovered. This house carried bigger space alongwith pomp, show and dignity in the society.

The toilets with the provision of soak-pits (pi. XXVIII) and other ancillary private apartments spread on its northern edge, in the trench J-15, K-15 etc., were the revelation of privacy and secludedness of a class Muslim, who projects boldly a bar on free movements of his inmates of woman folk with *purdah* system.

Trench H-15, has yielded a toilet of Indo-Islamic period which was well plastered with soak-pits and outlet drains.

The lane, running through Trench E-12, F-12, G-12, H-12, J-12, K-12 and L-12, is a conspicuously viable layout for traverse that directly lead to the interior enclosure *iprakara)* spread in trenches B-9, C-9, D-9, B-10, C-10, D-10, B-ll, C-l 1 and D-ll. This lane flanked on either side by the orderly residential locales, shows graceful planning with broad space for movement of the inmates of the locality with non-obstructive fareness for any class or community, and thus leading to social integration and internal security both running parallel. The locale runs with purposeful enclosure walls for safety and entrapment, for the society then needed. The trench H-12 prevaled the sanitary system of Muslim period or toilet of with outlet drain to the west of lane.

The objects found during excavation included copper coins of Hindu and Indo-Islamic rulers; beads made of carnelian, glass, terracotta, chalcedony; arrowheads; bangles of different type and colours; a hoard of mud ceramics; China wares; and pestles and grinding stones.

67. EXPLORATION IN DISTRICTS CHANDRAPUR AND WARDHA.—D.N. Sinha of the Aurangabad Circle of the Survey, during the course of exploration in the submergence area of Dindora Weir Project noticed the following antiquarian remains.

Taluk	*Village/Site*	*Nature of remains*
Hinganghat	Sindola Rith	Ruined Hemadpanti temple datable to the thirteenth-fourteenth century, early historical and medieval pottery
Warora	Bakharde	Prehistoric site
-do-	Keli	Dilapidated Siva temple (fifteenth-sixteenth century AD) on the left bank of Wunna river

68. EXCAVATION AT MULCHERA, CHAMORSHI, DISTRICT GADCHIROLI.—Excavation at Mauje Mulchera was taken up by the Department of Archaeology and Museums, Government of Maharashtra, under the general guidance of A.P. Jamkhedkar and K.D. Kawadkar assisted by Verulkar, Bansod and Bhoi.

Mulchera is located 80 km south of the Gadchiroli. Here at two localities trial excavations were conducted. Locality 1 is near the village Mulchera and Locality 2 is little far from village locally called Vivekanandpur. At both the localities the domical shaped mounds had been explored earlier by the Department.

Excavation at Locality 1 revealed a brick-built stupa. Two brick-built walls running in circle, one within the other and of 65 cm thickness and two walls bisecting these two circular walls were also exposed. The measurement of the brick was 36 x 18x17 cm. Few black and red ware sherds and a hexagonal crystal bead were the important finds from this locality.

Trial excavation at Locality 2 revealed a brick structure. The brick size was 60 x 30 x 7 cm. Few potsherds of red ware were collected.

Both the remains can be assigned between second and fifth century AD.

69. EXPLORATION IN TALUK AMALNER, DISTRICT JALGAON.—D.N. Sinha of the Aurangabad Circle of the Survey during the course of exploration in the submergence area of the lower Tapti Irrigation Project noticed a tomb and mosque of late medieval period at Dangri and early historic sites at Hingona Sin and Jalod; at the former site Jorwe ware was also found.

70. EXPLORATION IN TALUK NII>ANGA, DISTRICT LATURE.—Ajit Kumar of the Aurangabad Circle of the Survey during the course of exploration of the submergence area of Musalga Irrigation Project noticed in the village of Sone Sawanga a disturbed mound yielding early historic pottery and terracotta arecanut-shaped beads and wooden structure of seventeenth-eighteenth century.

71. EXPLORATION IN KUHI TALUK, DISTRICT NAGPUR.—In the course of exploration, Amarendra Nath assisted by K.P. Rao, S. Pratapchandran and N.K.S. Sharma of the Excavations Branch I, of the Survey located a number of sites yielding antiquarian remains.

Adam (21 ° (X)' N; 79° 27' E) a briefly reported early historic site *(1975-76,* p, 36), locally known as 'Killa' was re-explored. The site encloses remains of earthen rampart, measuring 325 x 325 m with gateways on the eastern flank; it yielded some chalcolithic pottery of the Tapti valley, such as fragment of a black-and-red ware bowl with coarse fabric with a distinct chalcolithic red-slip painted in typical black concentric lines numbering five in between two bands. The other fragment was also of bowl but with crude internal treatment; however, the exterior shows a distinct red slip with a typical chalcolithic painted decoration of comb-like design painted over three parallel vertical lines. This has nearest prototype in Tuljapur Garni, a site in the Puma basin of the Tapti Valley *(1984-85,* pp. 48-50, fig. 4).

The pottery of the early historical period is characterized by black-and-red, black-slipped, black burnished,-red-slipped and micaceous red wares having miniature pots, bowls, storage jars, lid-cum-bowls and carinated vases (fig. 19). On the surface a silo or a soakage jar, partially exposed, was noticed. Storage jars were of thick fabric and porous in nature. As usual, it was made up of gritty substance like sand, mica and some organic material like rice husk, mixed with clay. A few pots and lids have micaceous slip as a surface treatment.

Graffiti marks were noticed on three Black-and-red ware sherds. Out of the three graffiti marks found on the potsherds two are identical with a vertical line joined in its midway by two slanting lines on either side. The graffiti looks like an arrowhead. Similar graffiti was reported from Kaundinyapura and T. Narsipur *(Ancient India',* No. 16, symbol 5, pi. IV). The third graffiti has two parallel vertical lines joined by a horizontal line resembling the mathematical sign 'Pi'. This graffiti can also be compared to a similar one from Kaundinyapura.

A good number of stool-type or four-legged querns and mullers of cylindrical shape of Andhra-Satavahana type were noticed scattered on the site; some of these are collected by the villagers and worshipped as mother goddess, outside the tampan. Four copper coins were also picked up from the site. Important among them is a Kshatrapa (Nahapana ?) coin. Two coins attributed to 'Abdullah Qutb Shah of the Qutb Shahi dynasty of Deccan were issued in AD 1657-58. The fourth coin was issued by a Bhonsle ruler from Nagpur in the name of the Mughal emperor Ahmad Shah Bahadur who ruled from AD 1748-54. The coin is popularly known as the *'trishula'* type.

About 300 metres north-east of the rampart, was noticed a circular mound probably enclosing a stupa. A quartzite stone piece (6 x 5 cm) with fine Mauryan type polish on one side; was picked up from this mound.

Mandhal (20° 57' N; 79° 28' E) another early historical site *(1975-76,* p. 36; *1976-77,* p.39) was re-explored. A good number of microliths were collected from a small hillock locally known as the Bongi Hudki. The collection included blades with mid-rib, points, lunates, fluted cores and some flakes made on chert, chalcedony, agate and jasper as raw material.

At Panchkhedi (20° 54' N; 79° 23' E), two megalithic stone circles with cairn packing were noticed on the Mandhal-Amboli road on the western outskirts of the village. One of these is better preserved and is built of quartzite boulders, measuring 16 m in diameter with thick cairti packing. No cup-marks were noticed on any of these stone circles. The other burial of similar type, half in size but disturbed, was noticed by the side of this stone circle.

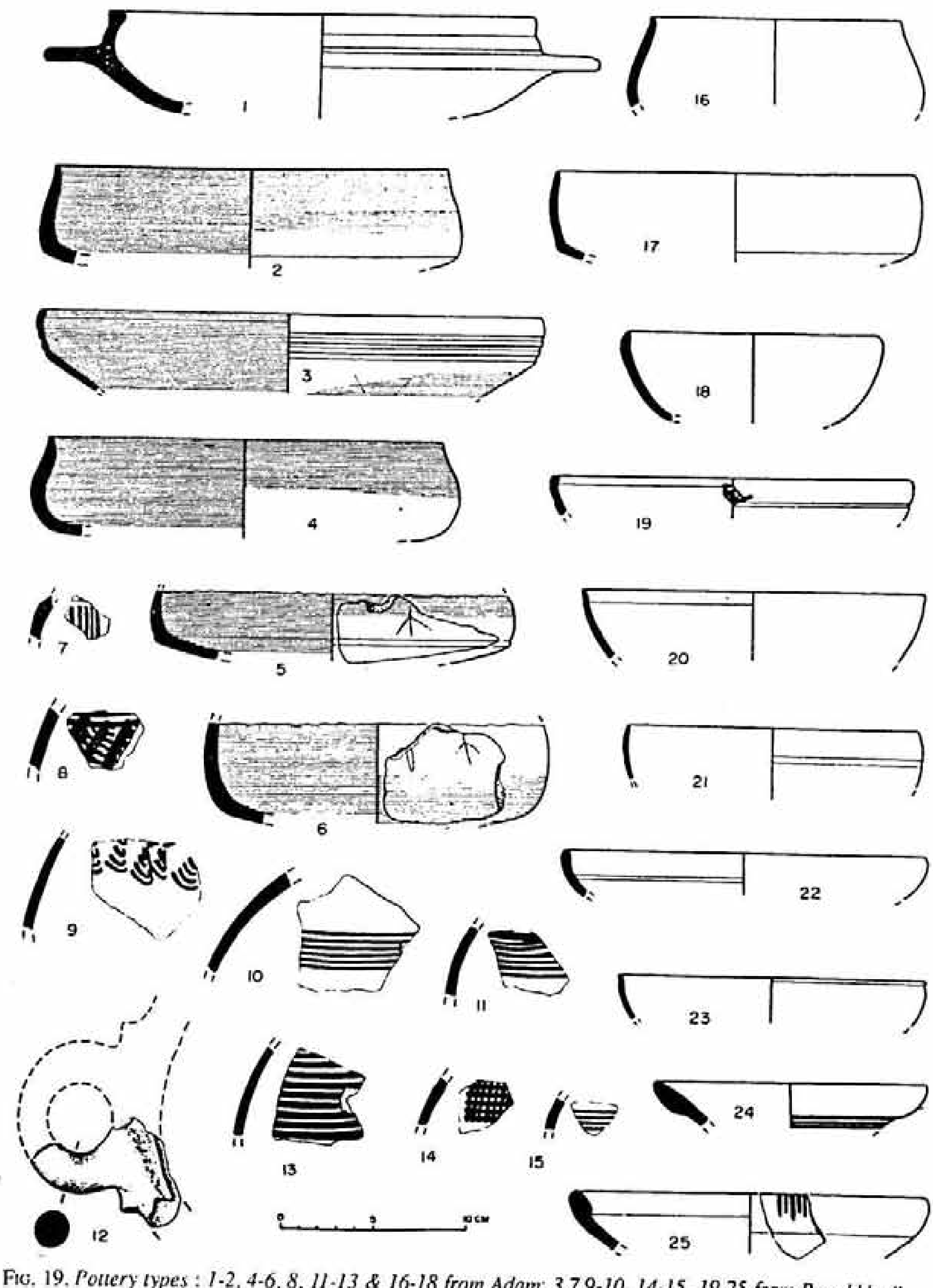


FIG. 19. *Pottery types : 1-2, 4-6, 8, 11-13 & 16-18 from Adam; 3,7,9-10, 14-15, 19-25 from Panchkhedi*

An ancient habitational site approximately 100 x 100 m was noticed about half a kilometre north-west of the village Panchkhedi. The site yielded black-and-red, black-on-red, black-slipped and black burnished variety of Black-and-red wares. It is quite likely that the megalithic circle, noted above, may have served as a source for its occurrence. Black-and-red ware mostly consisted of flat-based lid-cum-bowls with incurved featureless rim. Some of these have externally parallel grooved lines just above the base. Black-on-red ware revealed parallel lines, mat and wavy designs. The decorations were noticed only on the external surface. The micaceous ware mostly consisted of coarse variety storage jars and basins. They have very thick walls and flat base. Mica and sand seem to have been deliberately mixed to make this ware more coarse and porous. On the basis of surface finds the site can be tentatively dated to early historic period with distinct megalithic affinity.

72. EXCAVATION AT TER, DISTRICT OSMANABAD.—The Department of Archaeology and Museums, Government of Maharashtra, conducted excavations at Ter under the general guidance of A.P. Jamkhedkar and K.D. Kawadkar, assisted by C.S. Sali and G.K. Deshpande.

Ter is situated on both the banks of the river Terna (76° 12' 30" N; 18° 19' 20" E) and is 22 km north-east of Osmanabad.

Excavation was conducted in survey No. 142/2, 250 m away from the northern bank of the river to ascertain the nature of an accidentally exposed brick built tank. In all 12 trenches were laid around the bank.

The tank, measures 12-30 x 12-30 x 2-70 m and is built of burnt bricks with mud mortar and has two approaches. The brick size is of 1:3:6 ratio. The approaches are provided with steps each at south and east. Inlets to the tank were provided at different levels throughout the height of the tank. The base is paved with bricks. On the northern side, an aspidal structure, facing east, built in bricks was found. The thickness of the wall is 83 cm whereas the diameter is 1 -75 m. It had a compound wall of 83 cm thickness. The total area of the complex seems to be 14 sq. m. A secondary burial was found 6 m north-east from the compound wall of the complex under the floor. No associated antiquities were found along with the burial.

On the.east of the tank few small oval shaped pits were exposed. The pits were filled with ash and coal. The walls of the pits were burnt red. One of the pits contained two bones having cut-marks and a stone. In another three potsherds of red ware were found. From the same trench mud palletes and broken figure of Lajjagauri were found.

On the western side remains of a structure, square in plan, marked with white deposit were exposed. In this structure a small *kunda* measuring 55 x 55 x 70 cm, containing 70 bases of bowls, with flared mouth, of medium fabric red ware were collected. Remains of brick-lined drainage were also exposed on the western side of the plan. From the plan 352 bases of bowls with flared mouths and from the drainage 78 bases were collected.

In one of the trenches on the northern side a structure measuring 10-50 x 10-50 m was exposed.

During the course of excavation four types of pottery was retrieved. They include typical red polished ware, red ware of medium and medium to coarse fabric of thick and thin variety, black and red ware of the early historical period and coarse black ware.

Antiquities collected include beads of semi-precious stones, shell bangles, decorated bone, ivory pieces, broken stone sculptures, and ivory comb having depiction of a royal couple attended by female attendants on one side whereas on the other side is the Figure of Lakshmi. Stylistically the carving can be dated to first century AD.

The excavation revealed a complex of religious structures of first century AD in which a *tirthakunda,* an apsidal plan, fire place, offering bowls played an important pan. This was the first time that a secondary burial from early historical level, showing the continuity of the protohistoric tradition has been reported.

73. EXPLORATION IN DISTRICT OSMANABAD.—D.N. Sinha of the Aurangabad Circle of the Survey, during the course of exploration in the submergence area of the Kajala Irrigation Project, noticed Hemadpanti temple datable to thineenth-founeenth century at VVagholi and early historical site having shell bangles, terracotta and stone beads, terracotta mother goddess, pot and jar fragments of red ware, micaceous red ware and black ware from Waruda.

ORISSA

74. EXCAVATION AT LALITAGIRI, DISTRICT CUTTACK.—In continuation of the previous year's work *{1986-87,* pp. 64-67) G.C. Chairley, assisted by B.V. Rao, G.N. Srivastava, J.K. Patnaik, K. Srimani, S. Dey, S.B. Ganguly of the Bhubaneswar Circle of the Survey resumed excavations at Lalitagiri in the areas designated as Lalitagiri-2 or apsidal *chaityagriha* area and Lalitagiri-3.

In the course of digging in Lalitagiri-2, remains of a huge brick-built apsidal *chaitya* with projected entrance gate and stone-paved*pradakshiiiapatha* were exposed. At the extreme western end of this *chaityagriha* a circular stone stupa 3-35 m in diameter having base moulding and stone paved apron were also exposed (pi. XXIX). The base of the stupa has survived to about 1-50 m only above plinth level. Three carved stone pillars with sockets were found lying near the stupa indicating that stone railings were erected around it. Facing east, this *chaityagriha* measures approximately 22 m in length and is about 11 -40 m in breadth, the walls being about 3-30 metre thick, leaving an inner width of 4-75 m approximately. The inner floor of the *chaityagriha* is made of rammed *kankar* and lime. The courtyard around the *chaityagriha* is laid with paved stone slabs, taken from some earlier structure, on all the sides but for the eastern, which has 80 cm thick flooring made of rammed brick-jelly and mud.

At few places, digging was done up to deeper levels by cutting into the inner flooring of the *chaityagriha,* in which the drum portion of a brick-built stupa of an earlier period was encountered, suggesting thereby that the upper apsidal *chaityagriha* was built over the remains of an earlier stupa. This earlier stupa was enlarged at a later date when the original diameter of 7-60 m was increased to 8-90 m. On plan, it was found that this stupa was connected with an apsidal porch approximately 5 m in length, reminiscent of the stupa at Guntapalli in Andhra Pradesh.

A stone paved pathway, approximately 10 m in length and 4 m in width, was also exposed, which perhaps was the approach to this brick stupa. On the southern side of this pathway was found a square

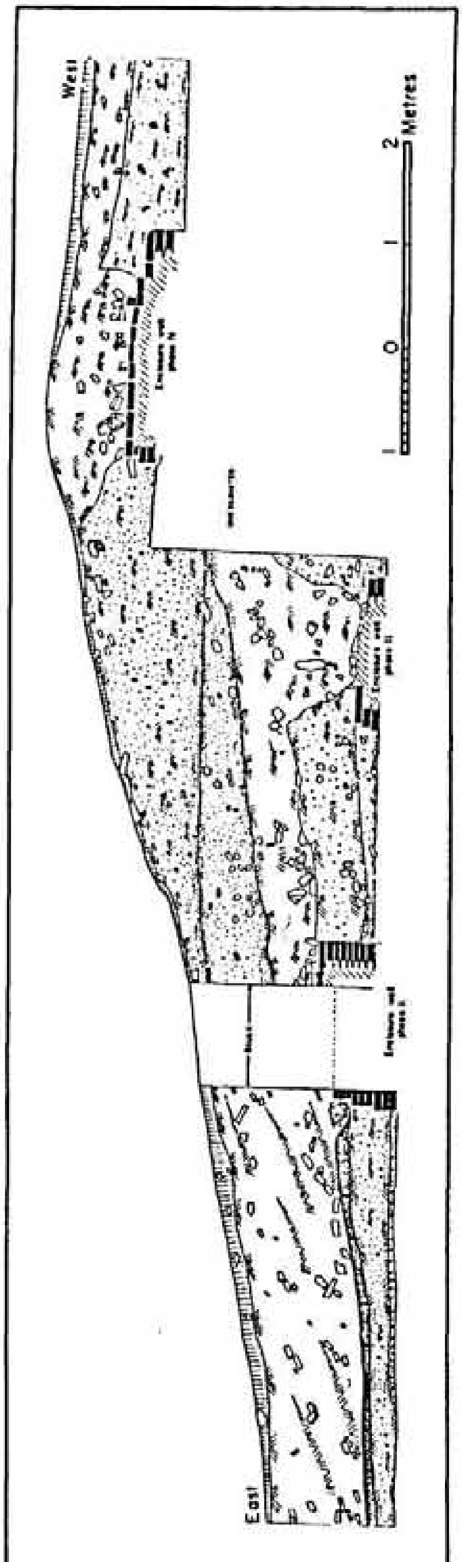


FIG. 20. *Udaygiri:1987-88, section across the enclosure wall of Phase II,III and IV*

pedestal (1-42 x 1-42 m), containing an inscription in Brahmi script of second-third century AD. The inscription records the completion of the seat *(asana)* of Adatadamana by Vinaya, a resident of Vadhamana and his disciple Budhitini, a resident of Aggotisila. On the either side of this stone pathway were found post-holes, which were probably meant for erecting temporary sheds.

The excavations at the entrance gate of the *chaityagriha* exposed at a depth of 80 cm from the plinth level of this structure, the remains of floor made of rammed *kankar* and lime spread over an area of about 100 m square. The foundation of the *chaityagriha* was cut from this level.

The antiquities found during the excavation were the stone images of Buddha, in different postures, Jambhala and fragments of Buddha image. Two images of Buddha in *bhumisparsamudra* datable to eleventh-twelfth century, are fine examples of workmanship. A stone bas relief, datable to second-third century AD depicting a half medallion (90 cm *x* 30 cm) was found fixed on the left of the pathway leading to brick stupa.

The pottery found from the site, almost negligible in number, is confined to dull ware of medium fabric. The types included *handi,* bowl and vases. Some of these sherds show incised decoration. A few red ware sherds were also found in which the main types were straight-sided bowls and fragments of beak-headed container.

75. EXCAVATIONS AT UDAYGIRI, DISTRICT CUTTACK.—In continuation of previous year's work *(1986-87,* p. 67), the Excavation Branch IV of the Survey under the direction of B.K. Sinha, assisted by K.M. Suresh, N.K. Sinha, P.N. Biswas, P. Biswas, M.P. Singh, R.N. Sahoo and S.K. Bhoi, resumed excavations at Udaygiri. The stupa and the monastery having been exposed in earlier years, the aim of this season's work was to expose the enclosure wall of the monastery, traces of which were found in the year 1985-86; to locate and expose the pathway leading upto the monastery and the gate complex, if there existed any; to expose the structure, lying in the area between the monastery and the stupa; and to expose the compound wall of the stupa.

Excavations revealed that the monastery (pi. XXX) was enclosed by a wall made of baked bricks set in mud mortar. Two types of bricks, handmade and moulded, have been used in the construction of this enclosure wall; the handmade bricks are larger in size and crude in appearance while the moulded ones are smaller in size and fine in appearance. The handmade bricks were used in the earlier phase of construction while the moulded ones were used in the later phases. Four phases of construction were found, each phase had a separate wall on the eastern side, while on the northern side, the existing wall of earlier phase was reused and extended southwards (fig. 20).

The wall of Phase I, on the northern slopes of the mound towards its central pan, was partly exposed. The foundation of the wall had been cut into the natural rock-face and it ran in a line across the slope. The wall, buiit of handmade bricks, was available upto nine courses in height and upto a length of 18-3 metres running east-west, with a width of 1-60 metres. On the eastern side, its extent was traced only to a length of 6 metres. Complete bricks were used in the front and back edge of the wall while the core was. filled with brickbats.

During Phase II, the total area enclosed was nearly doubled. On the northern side, the existing wall of earlier phase was extended southwards upto about 22 metres from where it turned southwards,

running across the eastern slope of the. mound. The wall of second phase running north-south, on the eastern side, was traced to a length of about 47-3 metres. The wall is available upto 22 courses at places, insplte of extensive brick robbing, and its north-eastern and south-eastern corners have been found. On the southern side, the wall is available upto a length of 2-25 metres beyond which its traces have been obliterated as a result of brick-robbing. There is a gap of about 4-5 metres in the centre of the wall on the eastern side in which a gateway was placed and another small one, possibly intended for a postern gate.

The wall of Phase III, laid on a laterite gravel bed and subjected to extensive brick robbing, is located about 2-30 metres west of the wall of Phase II. Placed on a higher level, it has been exposed upto a length of 22 metres only on the eastern side, has a width of 1 12 metres and is available upto 5 courses.

The wall of Phase IV, again available only on the eastern side, is located about 1 metre west of the wall of Phase III and is placed at a higher level. Excavations have revealed that after the wall of the Phase III fell into disuse the existing ground level, on the eastern side was considerably raised by filling laterite gravel and dumping other materials, over which the wall was built. The wall on its outer side has a foundation of pebbles and is available upto a length of 40-30 metres. It has four offsets on the inner as well as the outer sides which increase its\vidth from 1-82 metres to 2-30 metres.

Right in front of the sanctum sanctorum of the monastery existed an opening in the enclosure wall (Phase II), about 4-5 metres wide marked by two stone blocks kept on either side, through which a pathway led to the monastery. The pathway had edging of bricks at two places and of stones at one place. The pathway was of rammed earth mixed with brickbats.

Access to the interior from the enclosure wall, Phase II, was through a gate complex which had brick steps on its eastern side and a ramp on the western. The northern side of the gateway was decorated with a combination of mouldings and recesses. In the later phase (III and IV), the steps were filled with brickbats covering the step into a ramp.

Just before the monastery, a stone gateway was built over the ground, the level of which was raised by filling laterite gravel. This stone gateway rested on two stone blocks and was decorated with beautifully carved images interspersed with floral motifs. The gateway, at a later date, was completely destroyed by vandals; broken architectural members and pieces of sculptures were found littered in the area around.

On either side of the pathway between the monastery and the stupa, were found areas measuring 41-40 sq. m and 47 sq. m paved with bricks which were possibly used for congregation and assembly by monks. Besides these paved areas were found bases of two circular brick stupas, portions of 3 square brick stupas, and half a dozen bases of miniature stupas, made of stone blocks. One monolithic stupa 1 -5 metre in height, was found *in situ.*

The southern end of the enclosure wall of the monastery was found abutting against the brick compound wall of the main stupa which was excavated upto a length of 5-30 metres on the western side and 10-50 metres on the northern side. It shows two phases of construction. In the first phase, the wall was built up of handmade bricks while in the second phase moulded bricks were used. Excavations revealed that the entrance of the stupa was from the northern side, where an opening

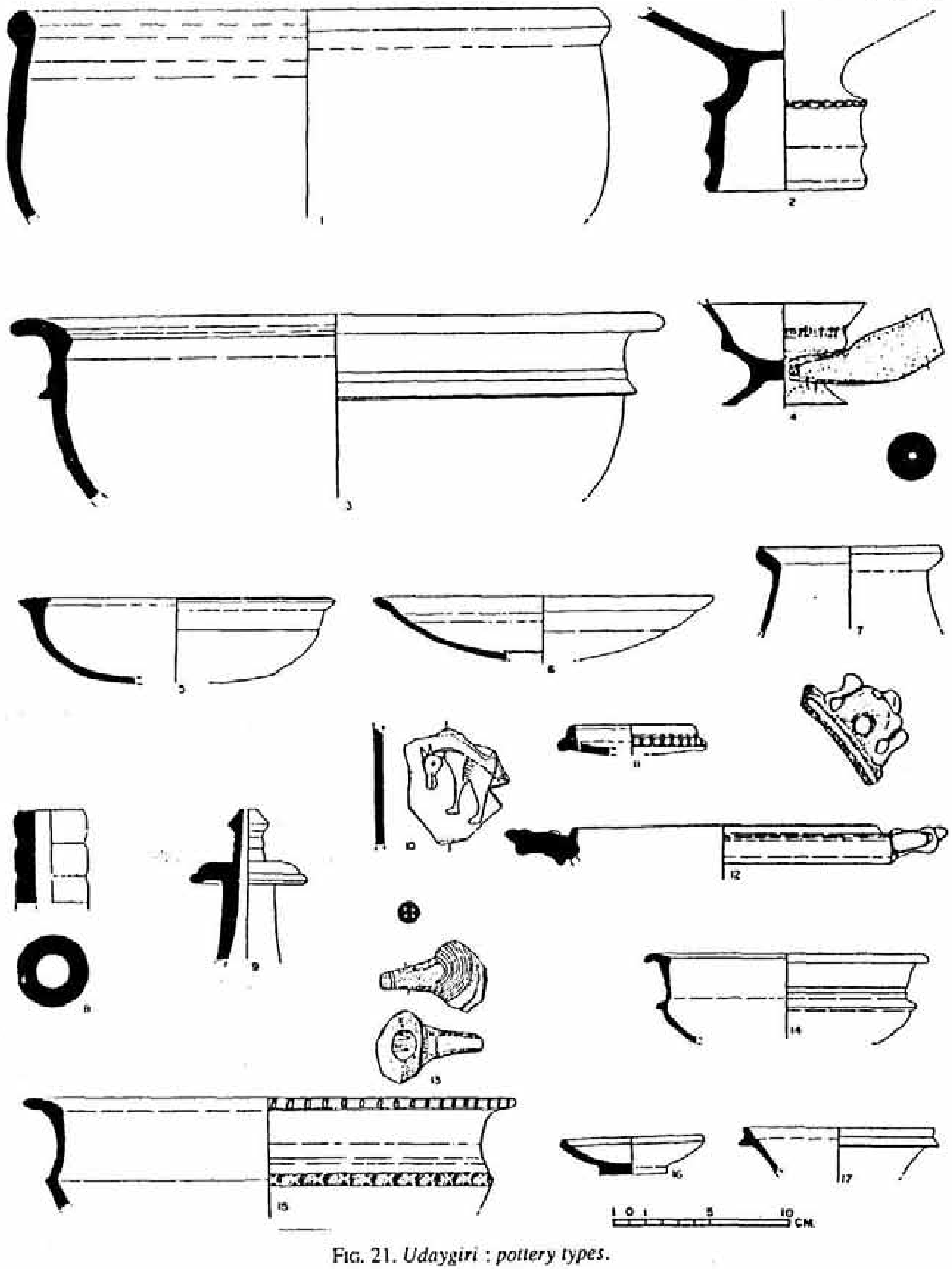


FIG. 21. *Udaygiri : pottery types.*

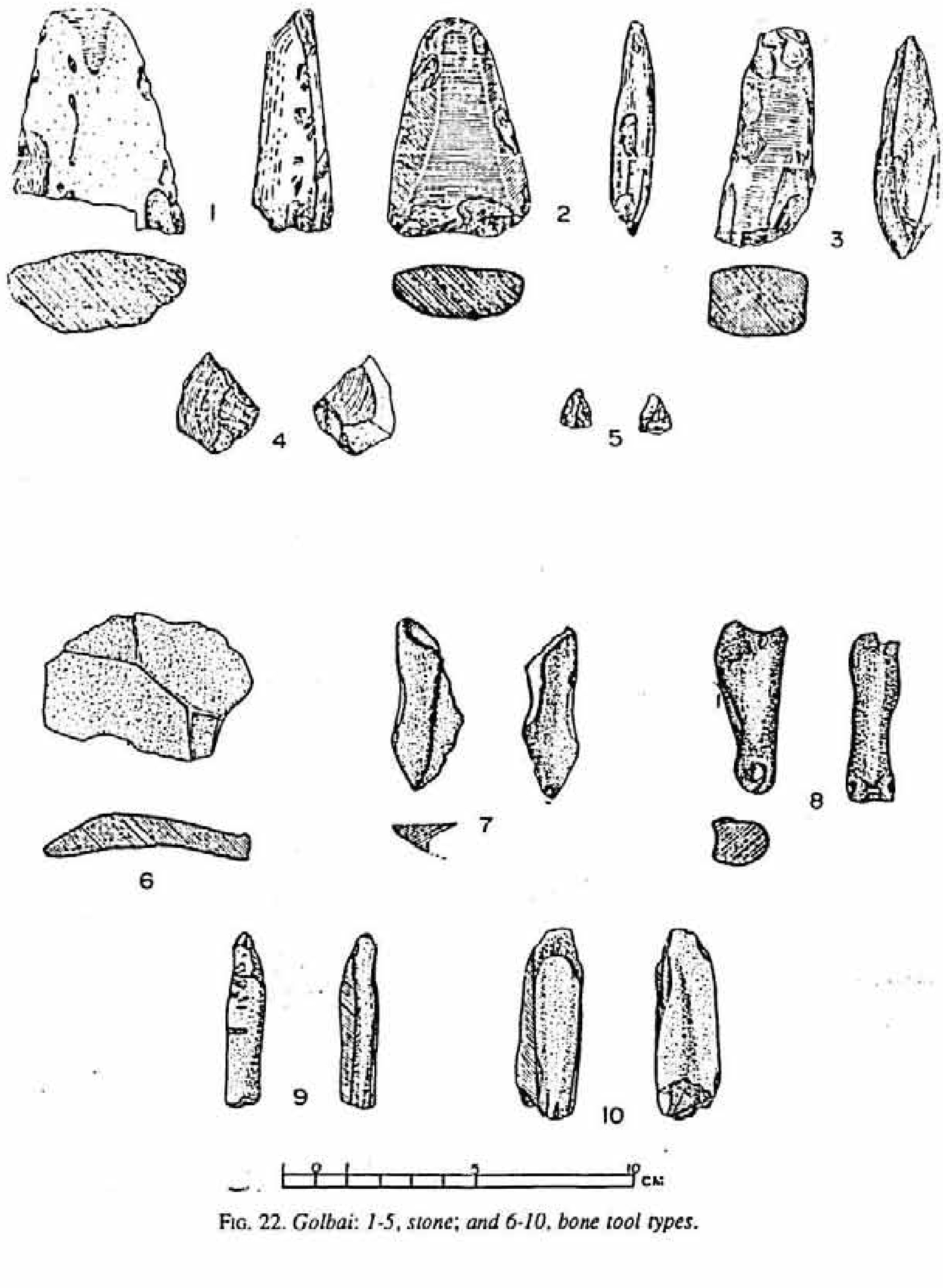


FIG. 22. *Golbai: 1-5, stone; and 6-10, bone tool types.*

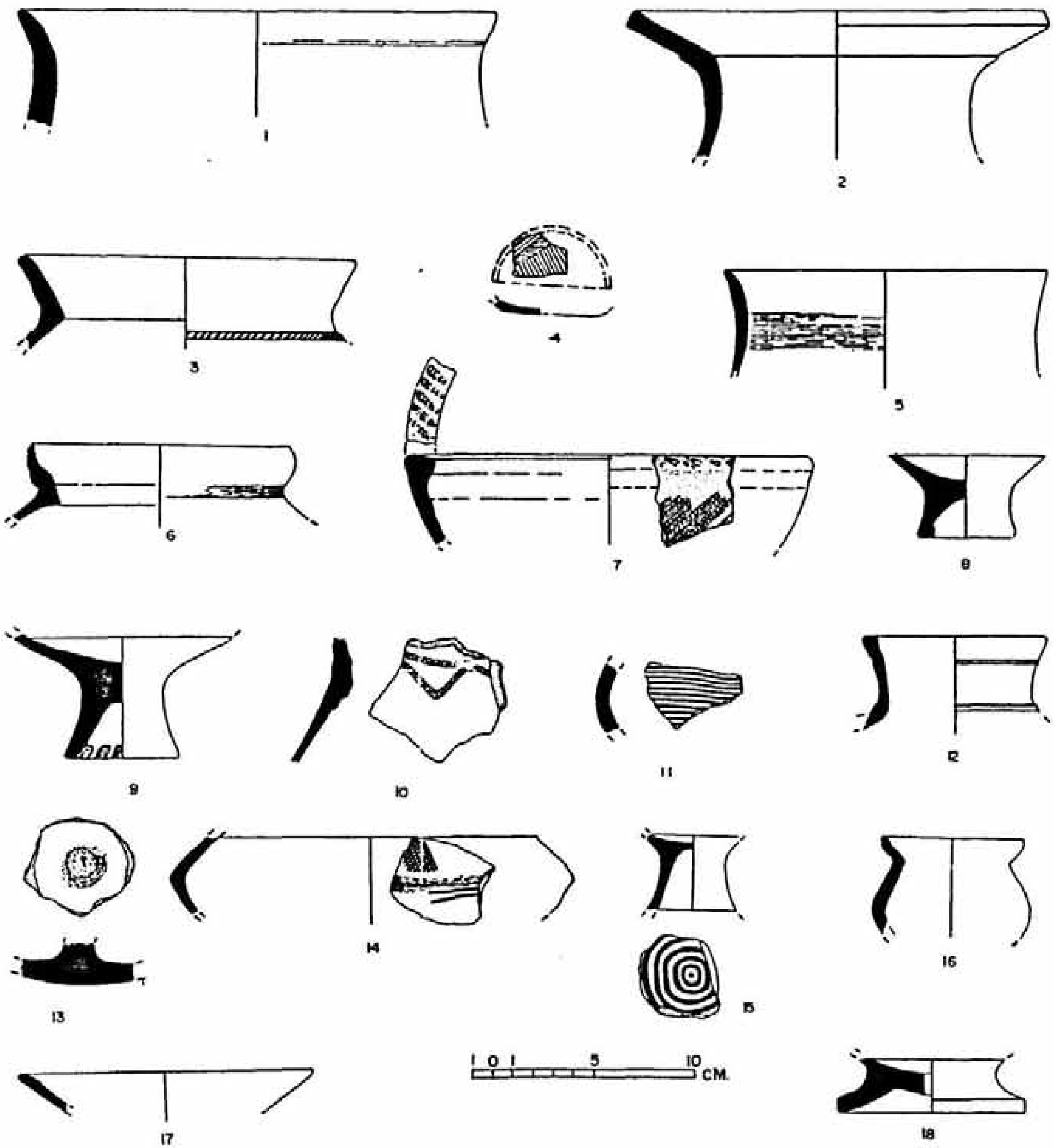


FIG. 23. *Golbai: Pottery types.*

existed in the compound wall. In the first phase, a gently ascending ramp gave access to the stupa while in the second phase, the ramp was replaced by a flight of steps.

In all ninety-five antiquities were found, majority of them being sculptures and architectural fragments. Other antiquities consisted of iron nails (pi. XXXI A), arrowheads, knife, spearhead, vegetable cutting knife, rings, terracotta plaques showing the image of Bodhisattva and Buddhist *dharani* (pi. XXXI B), baked clay sealing (pi. XXXI C), terracotta beads, gamesman, stone beads, stone ring and a circular gold pendant. Amongst the sculputres, most important were the images of Lokesvara, Avalokitesvara and Tara.

The pottery recovered showed both red and grey wares, the fabric ranging from coarse to fine. The most commonly occuring shapes were the basin with a prominent flanged rim having carinations at the waist and sprinkler in red, grey and black wares. The other shapes were dish-on-stand, incense burners, decorated earthen lamps, vases, troughs, bowls, *handis,* lids of various types and spouted vessels (fig. 21).

The decoration on the pots included incised, notched and applique designs. A potsherd carrying a thick red slip was incised with the figure of a galloping horse.

76. EXPLORATION IN DISTRICT PURI.—B.K. Sinha of the Excavation Branch IV of the Survey, assisted by Amarendra Nath and P.N. Biswas, re-examined the neolithic site at Golbai Sasan (20° 01' 45" N: 85° 33' 22" E), situated on the left bank of the river Mandakini, a tributary of the river Daya. The entire site, spread over an area of over 2000 sq. metres, was thoroughly explored and a good collection was made. A can track cuts right across the mound exposing sections of the deposit which is around 5 metres in depth.

The finds consisted of polished stone celts, stone chisel, flakes of fine-grained material and bone pieces showing secondary work (fig. 22).

The potsherds picked up from the site included handmade pottery associated with neolithic culture, crude black and red ware, and red ware carrying a thick red slip. A few sherds showed traces of ochre colour painting on a reddish surface which were post firing. The shapes met with were jars, *handis,* bowls, vases, chisel, dish-on-stand, lids and bowls with lug handles (fig. 23).

PUNJAB

77. EXCAVATION AT SANGHOL, DISTRICT LUDHIANA.—In continuation of last year's work *(1986-87,* pp. 69-71), the Excavation Branch II of the Survey in collaboration with the Department of Archae ology and Museums, Government of Punjab, Chandigarh, resumed excavation at Sanghol under the joint direction of C. Margabandhu of the Headquarters office and J.P. Srivastava of the Excavations Branch II assisted by S.S. Nayak, A. Jha, R. Krishnaiah, K.K. Sharma, J.S. Dubey, Lai Singh Mamani, J.S. Bisht, Birbal Sharma, S.K. Sharma, Chander Bhan, Shyam Lai and and D.D. Dogra of the Survey and Kuldeep Singh Sidhu, Gurudev Singh, Yograj and Hira Singh of the Department of Archaeology and Museums, Punjab. This season's work had three main objectives to realize. The first was to expose further the Kushana palatial, religious and residential complex at the Hathiwara Mound (SGL-1). Secondly to understand the cultural component of the Late-Harappan (Bara) and succeeding cultures

of the localities other than those already excavated in the last two seasons and finally to ascertain the nature of the general planning of the site and the sequence of different periods in detail. For the first objective the already excavated area at SGL-1 (Hathiwara mound) was further extended horizontally. For the second, trenches already laid at SGL-6 were extended and trenches were laid at new area at SGL-13. For the last further excavations were continued at SGL-2 and SGL-9.

Excavations at SGL-1 further exposed the palatial complex on the northern and eastern sides. The open assembly hall (palatial complex) characterized mainly by burnt-brick (32 x 21 x 5,38 x 24 x 5 cm) floors and also by the brick-built wall was further extended in the same structural phase. It was uniform in plan in the entire area excavated so far with circular post-holes cut on the brick floor and was encountered at a depth of 2-52 to 2-60 m. Since the walls were of huge size running in north-south direction, and further extending, it seems to suggest a fairly large wall with one metre width made of 42 courses of bricks, but its exact nature and features are yet to be determined. During the course of excavations many later additions of walls were noticed built on the brick floor with re-used bricks. This palatial area yielded a large number of copper coins, iron objects, beads of semi-precious stones, number of terracotta, animal and human figurines, toy-cart wheels, ear-studs, seals and sealings, etc.

Another structure situated to the south-east was further extended on sides to understand the complex in details. It consisted of an elaborate plan with contiguous rectangular and squarish cistern-like structures built close together by the side of a burnt-brick rectangular platform (pi. XXXII A) which may possibly be a part of some ritualistic complex *(havan kundas).* On plan it had two rectangular enclosures measuring 3-30 m x 1-50—1-70 m towards the north and south of the brick platform and another two square enclosures measuring 2-50 x 2-60 m towards the west of the platform, all of them built together. The outer wall on the southern side (exposed so far) measured 5-80 m and had a width of 0-65 m. Similarly the outer wall on the north measured equal length whereas the width is only 40 cm. It further continues to the west. The bricks measured 32 x 21 x 5 cm and 3 1 x 2 1 x 5 cm. They were built with two offsets inside at lower levels. The extant height ranges between 1-10—1-30 m with 22 courses of bricks so far exposed.

All of the burnt brick single course enclosures inside below yielded only ashy material, charcoal, charred grains and burnt loose earth. However, in the upper portion of this area stray bones of animals were also found and at one place towards the south-west corner outside the enclosures were having thick burnt mud plaster over the burnt bricks, inside and on all the four sides.

These structures have been built in continuous series (further portion yet to be excavated) connected by burnt brick floor pavement at the top and running slopy drains, with provision for passing out water in the south and western parts of the complex. On the northern portion of the wall on the rammed floor were also exposed contemporary circular hearths with ash and loose earth (pi. XXXIII A). The portion is also bounded by a brick wall partly exposed.

This whole complex seems to have been built in two phases. The earlier one was built of mud-bricks, measuring 35 x23 x 5 cm and subsequent phase was built of burnt bricks of 32 x 23 x 5 cm generally with mud plaster and also in one case coated with lime plaster at the top of the western platform in a limited area. Remains of a later burnt brick structure were also noticed over these

enclosures in the southern and eastern pans. The north eastern part of this complex (trench ZG 10) yielded a large number of seals and sealings in Brahmi script of fourth-fifth century AD. Some of them tentatively read *Mahasenapati, Sri dandanyaka,* etc. They are oblong or round in shape made of baked and unbaked clay, depicting in relief (or of intaglio type), standing women, figures of royalty and nobility, seated lion or couchant bull, head of an elephant, motifs such as *dharma-chakra, srivatsa, vedi,* etc. Apart from these antiquities, this complex also yielded a large number of objects ascribable to the Kushana and later times with a very few and rare pre-Kushana finds.

In continuation of previous year's excavations which have unveiled a house complex and habitational strata of five structural phases on the southern periphery, trenches were laid to lay bare the structures in between them. Excavations have exposed a residential complex, separated possibly by a street, it being a corner house. The trench was dug upto the natural soil reached at a depth of 7-60 m. The habitational.strata consists of an upper structure built with refused materials, the lower structures are of mud-bricks, whereas the intermediate stage of buildings belong to the mature Kushana period mostly made of burnt bricks of varying sizes 33 x 24 x 6 cm, 33 x 21 x 7 cm, 30 x 20 x 5 cm and 23 x 15 x 6 cm a part of the house consists of a kitchen, living room, bathroom, platform and a side entrance which opens to the bylane. A burnt brick drain was also encountered leading into the lane. Ceramics found in this area consist of red ware bowls, with incurved rim, dishes with flat base, sprinkler, vases with long vertical neck, ink-pot type lids, various kinds of jars, etc.

Excavations at SGL-2 brought to light remains from the Late Harappan (Bara) to the Kushana period. In this season, one of the trenches was excavated upto the natural soil encountered at a depth of 12-65 m. Eight structural phases were noticed in the Late Harappan (Bara) period (Period-I) as against six phases in the earlier season. The walls were made up of mud, except in phase IV where the blocks of mud measuring 48 x 40 x 8 cm have been used. Floors of rammed earth made of mud and *kankar* mixed, were also noticed in the fifth, sixth and seventh phases of the Late Harappan levels, but the orientation is slightly shifted towards the northern portion. The eighth phase is represented only by a mud floor.

Two interesting features of this period are to be emphasized: on the mud floor was found placed *in situ* a burnt terracotta object the purpose of which is not clear. Similar evidence has also been reported from many Harappan sites such as at Banawali, Ropar, Hulas, etc. Signs of burning along with ash indicate that it was fixed in position, on the floor adjacent to a side wall of the room. In another room was found on the mud floor a terracotta cone-shaped object and a vase covered by a stone, all *in situ* possibly intended for a ritual (pi. XXXIII B).

Important objects of this period includes beads of terracotta, agate and faience, terracotta bangles, toy-cart wheels and balls.

It was succeeded by a horizon of 40 cm thick deposit which yielded PGW with associated grey and other wares. Some black-slipped ware and Late Harappan ceramics also continued in this period. Notable among the objects include terracotta beads, bone styluses, etc.

The next period is characterized by ceramics of black-slipped ware and associated red wares. The structures were built of large sized mud bricks (36 x 22 x 6 cm) and bumt bricks (33 x 22 x 6 cm) and

are mainly pre-Kushana in character. During the Kushana period four structural phases represented by walls of burnt as well as mud bricks were exposed.

Last year's excavations at SGL-6 revealed the presence of Bara culture followed by the 'overlap phase' with grey ware of the PGW lineage and black slipped ware and lastly the early historic phase with structures built of mud and burnt bricks of fairly large size, ascribable to the pre-Kushana times. In this season no structures ascribable to the Late Harappen times has been encountered. But the ceramic industry was quite rich. Painted red and red wares were prominent. Faience bangle pieces, bone stylus, beads of agate, jasper, faience including terracotta animal figurines were found in large number.

A very significant discovery of this season was a hearth and other structural evidences of the PGW and black-slipped ware people. Important antiquities are beads of semiprecious stone and terracotta, glass bangle pieces, etc.

Excavations at SGL-9 continued in this area to confirm the cultural sequence exposed in the last season. The natural soil was reached at a depth of 18 m. The settlement starts with Late Harappan culture of which only a mud structure was exposed. There does not seem to have been any extension of habitation here, later until the settlement expands during the early historic period.

In this period very rich cultural remains have been excavated including structures in mud and burnt bricks. Nine structural phases of the Kushanas were noticed with burnt bricks, mud, lime and rammed earth floors (pi. XXXII B). Large quantity of ceramics in various shapes of red ware, painted in black, miniature vessels, storage jars, large-necked vessels, some with soot and rusticated marks, spouts, lids, bowls etc., were the domestic outfit found. A rich variety of antiquities of the Kushana period and later were also recovered. Noteworthy, however, were a few sherds of Harappan variety consisting of fragmentary goblet, beaker-shaped miniature pots, etc., just above the natural soil, along with the Bara type ceramic, denoting a cultural contact without any habitational real Harappan elements.

With a view to know the details of the cultural assemblages of the pre-Kushana period, a trench was laid in the southern portion of the extensive mound (SGL-13). The earliest level assignable to the Late Harappan yielded a rich variety of ceramics including the painted and incised designs.

In the next period though the overlap evidence is traceable.black-slipped ware is more distinct. A mud brick structure was exposed. Antiquities found included terracotta ear-studs, shell beads, ivory and bone styluses. It was succeeded by the early historic period, with four structural phases, essentially pre-Kushana in character. The earlier two phases were represented by mud and unbaked brick walls. In the third and fourth phases both baked and unbaked bricks were used for buildings on an extended scale. Two house plans one on each side were exposed separated by a line 1-50 m in width. The mud and burnt and reused bricks measure 32 x 22 x 6 cm, 40 x 30 x 8 cm, 24 x 22 x 6 cm respectively. A large number of copper coins including the ruler Gondopharnes, seals and sealings having legends in Brahmi and Kharoshthi are noteworthy.

So far the antiquities are concerned they are quite rich and considerable and the range of varieties is immense. Among them are human (pis. XXXIV A and XXXV A) and animal figurines (pi. XXXV B) in terracotta. Varieties of stamps (pi. XXXIV B) of both circular or square, some with handles were

found with designs such as geometric, star and flower patterns. Other objects in terracotta included varieties of wheels of toy cans (pi. XXXVI A), cart frames (pi. XXXVI B), ear-studs or plug (pi. XXXVII A), weighing balance (pi. XXXVII B), etc. The antiquities also comprise of numerous seals and sealings, some of them reading *Sri Jeebiya, Sri Darasya, Sri Rudrasaramasya, Sri Haridattasya, Sri Nandikasya* in Brahrru characters of the fourth and fifth century AD. On top of these sealings are depicted couchant bull, bull facing left or right, lion seated on its haunches and other motifs such as *srivatsa, triratna* (pi. XXXVII C-D), etc. Seals and sealings bearing Kharoshthi inscriptions are also not wanting. Copper coins were also found in abundance belonging to Indo-Parthian period, coins of Gondopharnes and Kushana rulers, specially coin of Vima Kadphises and Vasudeva are noteworthy. Variety of shell objects included simple and decorated bangles; decorations consist of rope, wavy, channel, dots, dash and cut designs and together with the columela and core of shell indicate it was a thriving local industry. Many fine bangles with inlaid spaces (pi. XXXVIII A) show signs of rivetting by copper bronze nails possibly for continuous use. Bone and ivory objects (pi. XXXVIII B) are represented by decorated human shaped pendants with perforation at the top for hanging, combs, circular plaques with geometrical and floral designs, points (pi. XXXIX), knuckle bones, etc. Varieties of beads are found made of semiprecious stones, shell, faience, paste and terracotta (pi. XL A-B). An unique shell pendant in *sankha* has an inverted bell shaped cover attachment on top possibly soldered to fit in for hanging (pi. XL C).

RAJASTHAN

78. EXPLORATION IN DISTRICT BHARATPUR.—In the course of village-to-village survey scheme D.N. Dimri of the Jaipur Circle of the Survey conducted exploration in the Bayana taluk and discovered the following sites of archaeological interest:

Taluk	*Village/Site*	*Nature of remains*
Bayana	Chak-Nawali	Temple remains of eighteenth century
-do-	Dehgaon	Historical mound
-do-	Kanwar	Historical mound, temple of Thakurji assignable to eighteenth century
-do-	Nawali	Historical mound

79. EXPLORATION IN DISTRICTS JAIPUR AND SIKAR.—P.L. Chakravarty and Vijai Kumar of the Department of Archaeology and Museums, Government of Rajasthan explored the following sites of archaeological interest:

District	*Site*	*Nature of remains*
Jaipur	Amarpura	Sunga-Kushana
-do-	Aman Sar	Sunga-Kushana

Taluk	*Village/Site*	*Nature of remains*
Jaipur	Barodiya	Ganeshwar Culture
-do--	Barwars	Late stone age, Ganeshwar Culture
do--	Bhagawas Ahiran	Late stone age
do--	Bhamod	Sunga-Kushana
do--	Bheem-ji-ki Doongri	Early stone age
do--	Bijak-ki Pahari	Early stone age
do--	Chak-Dhanota Nagal	Late stone age
do--	Chak-Dhelwavan	Ganeshwar Culture
do--	Chak-Kharda	Black and red ware
do--	Chak-Muzzafarpur	PGW
do--	Chak-Peoplod	Sunga-Kushana
do--	Chak-Sanga-ka-was	PGW
do--	Chak-Sheo Singhpura	PGW
do--	Chatarpura I	Late stone age
do--	Chatarpura II	Kushana
do--	Chimanpura	Ganeshwar Culture
do--d	Chith wari	Ganeshwar Culture
o--d	Dadshahpur	Late stone age
o--d	Devan	Ganeshwar Culture
o--d	Dvipura	Ganeshwar Culture
o--d	Dolaj	Sunga-Kushana
o--d	Ganeshpura	Ganeshwar Culture
o--d	Gothnari	PGW
o--d	Hanuvatpura	PGW
o--d	Pragpura Kuradot	Kushana
o-	Vijai Singhpura	Sunga-Kushana
Sikar	Bhageshwar	Ganeshwar Culture
-do-	Bhagodha	Ganeshwar Culture
-do-	Bhagoga	Ganeshwar Culture
-do-	Chala	Ganeshwar Culture
-do-	Chapar	Ganeshwar Culture
-do-	Govindpura	Ganeshwar Culture
-clo-	Imloha	Ganeshwar Culture
-do-	Jheer-ki-Chowki	Ganeshwar Culture
-do-	Jhiloo	Ganeshwar Culture
-do-	Khobra Road	Ganeshwar Culture
-clo-	Kokana	Ganeshwar Culture
-do-	Mabri	Ganeshwar Culture

Taluk	*Village/Site*	*Nature of remains*
Sikar	Mahava	Ganeshwar Culture
-do-	Mandoli	Ganeshwar Culture
-do-	Mawnda	Sunga-Kushana
-do-	Natha-ki-Nagal	Ganeshwar Culture
-do-	Nijhara	Late Stone Age
-do-	Puranavas	Late Stone Age
-do-	Saladipura	Ganeshwar Culture

80. EXCAVATION AT GANESHWAR, DISTRICT SIKAR.—In continuation of previous work *{1983-84,* pp. 71-72) P.L. Chakfavarty and Vijai Kumar of the Department of Archaeology and Museums, Government of Rajasthan resumed excavation at Ganeshwar (37° 40' N; 75° 51' 30" E). The objective was to re-examine the hypothetical sequence of cultures in the lower levels. With this end in view six trenches Q, R, S, T, U and V were laid on the eastern and central pan of the mound. In addition two sections of the mound on the south west corner were also carefully scraped in order to ensure the sequence. Excavation revealed three cultural phases.

Phase I, with a deposit of 30 to 50 cm is represented by a true mesolithic hunting-gathering settlement. Microliths and animal bones were the main cultural elements of the Phase. The main raw materials were quartz and chert. Though quartz was used on a larger scale, but the majority of the finished tools were made of chert. The industry is essentially geometric in character. Its main tool types are retouched and blunted back blades, obliquely blunted or pen-knife blades, triangles, points, crescents, trapeze and transverse arrowhead. Scrapers and burins made on flakes occur in very small numbers. Another distinctive feature of the industry is the complete absence of the crested guiding ridge technique, a feature that is ubiquitously characteristic of India. It is also to be noted that tools were manufactured within the settlement as the finished products are always associated with large quantity of waste material. And every family or social unit must be manufacturing tools for its own requirement.

Animal bones were profuse and like that of the microlithic industry more common in Phase I. A feature of the bones from the lowermost levels of this phase is predominance of small bones, indicating greater exploitation of small game and birds at the beginning of the settlement. Later larger bones are more frequent. These, unlike the small bones, are often charred and nearly always broken and were split open for the extraction of marrow. The vast quantity of the bone material recovered belongs to the wild animals.

Phase II, with a deposit of 40 to 60 cm, is characterized by the introduction of new material traits and change in economy. The pottery christened as Ganeshwar-Jodhpura Ware occurs in large quantity. Copper had come to be used for tools and weapons.

The pottery of this phase is partly handmade and partly wheelmade. It is largely made of micaceous, coarse clay and very inadequately fired, producing dark smoky core. It is highly fragile and begins to crumble fast after exposure. The surface is treated with a slip of even thickness varying

in individual pots. Originally, the surface of the slip was a bright red, but in course of time it had largely faded away, and present surface colour in most sherds and pots is a dull brown. A small number of sherds were, however, made of well-levigated fine clay and found well fired with an ochrish core and are fairly sturdy. The pottery forms include narrow and wide mounted jars, small squat *handis, lota-like* carinated vessels of various sizes, shallow pans, bowls of various sizes and deep basins. A miniature narrow mouthed cylindrical pot was probably used for storing some precious liquid and an equally miniature bowl-like form found near this pot probably served as a lid for the latter. Some of the pots were decorated by incised designs like group of straight or wavy lines, chevrons, herring bone patterns and criss-cross, but none of them is painted, while technologically the pottery was of medium quality, functionally they cover the entire spectrum of storing, cooking and eating and drinking vessels.

The copper implements are very few in number which include five arrowheads, three fish-hooks, one spearhead and an awl. This testifies the introduction of copper at Ganeshwar. Microliths and animal bones also occur in good number. Evidence of structures consisted of paved floors and circular hut outlines. Floors were paved with river pebbles and schist slabs quarried from the nearby rocks.

Phase III is characterized by the copper age in fullness of its evolution. The copper implements are most profuse accounting 99 percent of the total material. These included copper arrowheads, rings, bangles, spearheads, chisels, balls, celts, etc. This is a very important feature that such a rich find of copper objects numbering several hundred has been found at a single small site. But equally, to the point is that the site is near the mines and in association with a distinctive ceramic industry of the region. The thin blades, arrowheads and fish-hook are also characteristic of Indus sites have not been found in copper hoard sites of western Uttar Pradesh. The presence of a round terracotta cake of Ganeshwar is also very important. The principal varieties of Ganeshwar pottery are goblets, beakers, tumblers, handled bowls, elliptical vases, cylindrical vases, lids, jars, offering stands, dishes, basins and miscellaneous type of pottery of pre-Harappan affinity.

The archaeological record at this juncture very clearly reflects a slow but steady decline in the quantity of microliths and animal bones. This is an insight into the process whereby mesolithic hunter-gatherers adopted their way of life to copper age.

The evidence of Phase III at Ganeshwar has added a new horizon to pre-Harappan copper technology. The problem of origin and chronology of Copper age in India can be studied in view of the findings in this phase.

Phase I of Ganeshwar can be dated around 3800 BC while Phase II emerged during 2800 BC. The Phase III was in existence in 2000 BC and lasted upto several centuries. This study is based on the basis of C14 study of Jodhpura which has given pottery quite akin to Ganeshwar assemblage.

TAMIL NADU

81. EXPLORATION IN DISTRICT CHENGALPATTU.—G. Thirumurthy, of the Madras Circle of the Survey while carrying out exploration around Madurantakam taluk discovered a potentially important prehistoric site at the village Orathi. The tools/finds included scrapers, neolithic hand-axes,

chisels, etc. Besides these, black ware, red ware, Black-and-red ware assignable to Megalithic period were also collected.

In the village Kongarai Mampattu, an extensive megalithic burial site represented by cairn-circles was discovered. The burials have an average diameter of seven metres and are mostly disturbed.

In addition, a dilapidated Siva temple of the Chola period and Jaina bas-reliefs in village Anantamangalam, Saivite temples at Vepankaranai, Senaiyaneri, Orathi Kongarai Mampattu and loose sculpture at Vinapundi, Senaiyaneri and Sirudamur all in Madurantakam taluk were also noticed.

82. EXCAVATION AT KUDIKADU, DISTRICT SOUTH ARCOT.—The Department of Ancient History and Archaeology, University of Madras, under the direction of K.V. Raman undertook excavation at Kudikadu. The site is situated on the east coast of Chidambaram. The mound covering an area of about 90 acres belongs to the SIPCOT Industrial Complex, rising to a height of 2 to 3-5 m above the surrounding plain.

Two trenches (KDU-1 and KDU-2) were laid out on two different points of the mound. Both the cuttings were carried down to the natural soil at a depth of 2-5.m at KDU-1 and 3-2 m at KDU-2.

The whole deposit represented a single cultural period and is characterized by the ceramic varieties like the Rouletted ware, amphorae pieces (both original and imitated), black-and-red ware, black ware, red polished ware, red slipped ware and large quantity of coarse red ware. Antiquities included large number of beads made of glass and various semiprecious stones like jasper, chalcedony, agate, quartz, etc; terracotta human figurine, ear ornament, votive lamp, spindle whorl, gamesman and hopscotch; a copper pendant; and pieces of various iron objects.

In KDU-2, at a depth of 0-47 m, a wall with a width of 0-70 m in east-west direction was exposed. It consisted of three courses of burnt-bricks. As the wall continued beyond the trench on both the sides its length and full orientation could be determined after further excavation. The presence of many incomplete beads on the floor adjacent to this wall suggests that it was probably associated with the bead making industry. The size of the bricks (35 x 22 x 6 cm) used in this wall is similar to the bricks found in the excavations conducted in the places like Kaveripattinam, Uraiyur, Kanchipuram and Appukkallu in Tamil Nadu. In the same trench at a depth of 0-70 m a floor level with post-holes was also noticed. As evidenced by the discovery of the Rouletted Ware, amphorae pieces, Black-and-red ware, black ware and plenty of semiprecious stone beads, this site can tentatively be dated to first century BC to second century AD.

UTTAR PRADESH

83. EXCAVATION AT FATEHPUR SIKRI, DISTRICT AGRA.—In continuation of the last year's work *(1986-87,* pp. 73-75) the Agra Circle of the survey, under the direction of Shankar Nath assisted by P.B.S. Sengar, C.P. Singh, Makrand Prasad, B.B. Sur, Y.K. Sharma, Chiranji Lai resumed excavation in FPS I and FPS VIII.

FPS I : The area situated between the western wall of the so-called stable and the modern *kharanja* pathway leading to Hathi Pole was taken up for excavations and revealed remains of a residential structure which faces north. It consisted of one main room (measuring 5-75 x 3-90 m) and three attached rooms (measuring 5-80 x 2-50, 5-80 x 2-50 and 3-50 x 2-50 m). These rooms are in a row and run east to west. The western and central rooms are interconnected through an entrance (1-10 m). The eastern (3-50 x 2-50 m) is a separate one. A verandah runs along the northern-western and eastern sides of the main room. The verandah was measured 14 x 3-60 m in all the sides. The room is provided with seven gates of equal width of 1-10 m. Three of them open on the verandah in northern, eastern and western sides and remaining two gates of them open on to the each of the two attached rooms located in southern side. The verandah is measured equal 14 x 3-60 m in all sides. The platform of this verandah is edged with rectangular stone slabs measuring 2-15 x 0-48 m. The roof of the verandah probably was supported by the pillars as is evident by the stone pillar base encountered *in situ* during excavation. The verandah at the northern side has been provided with a flight of three steps which seems to have been the main approach to this complex.

The room on the eastern side is rectangular on plan and measured 3-50 x 2-50 m. It faces north and is provided with 1 • 10 m wide gate and opens on to the small courtyard. The eastern enclosure wall of this complex has been partly overlapped by the western wall of the so-called stable. It appears to have been raised at a later stage over the eastern wall of this exposed structure. The walls of this complex contained niches of different measurements and plastered with lime as confirmed by the presence of patches of lump plaster on the walls. The walls of the main room are decorated with the design of rectangular panels. These panels are painted in red and provided with a blue border around them. A separate decoration made through the graffiti on the plaster of the wall is worth to be noted. The decoration represent the scenes of boatman sailing boat in the lake, landscapes, fishes, dagger, sword and anchor, etc.

Eight pillars (75 cm x 55 cm) and a room made of stone and lime mortar attached with the outer face of the southern side were also exposed. These pillars were probably once carrying the load of water channel running from the Hathi Pole to the complex of Abdu'l Fazl and Faizi. The room faces south and is provided with an entrance which contained three seats of latrine and a platform for keeping the water vessels. The floor of the room has been provided sufficient slope to drain out waste water through the underground drain. In between the southern wall of the exposed structure and the platform of existing structure, a small platform (110 x 1-10 m), built of undressed sandstones and paved with stone slabs was also exposed. A huge earthen basin was found buried within the eastern edge of this platform. The platform and latrines seem to have been built for the use of the Chowkidar who lived in the existing structure. A room measuring 3 x 2-65 m was exposed in the courtyard of the standing structure. The room faces south and is provided with an entrance.

All these structures are built of undressed stone blocks. The thickness of walls and lime plaster of these structure varies from 1 m to 1-60 m and 3 cm to 9 cm respectively. The floor of these structures is made of lime concrete base and covered with a thin layer of fine mortar to provide smooth surface.

Pottery recovered during excavation included red ware and glazed ware. The prominent shapes are the vases, large dishes, bowls, *chilams* and carinated *handi.* Some sherds of red ware bear stamped decoration.

FPS VIll : The site is situated 1 km north-west of Jama Masjid and half a kilometre east of Ajmeri Gate along the northern fringe of the ridge near Hada Mahal. The excavation revealed three cultural phases of habitation at the site. Phase I is represented by an average deposit of 1-30 m thickness and is characterized by the occurrence of PGW alongwith associated wares and a few sherds of black-slipped and black and red wares. The deposit did not yield any structural remains. Other finds of this phase included terracotta g/wra-shaped beads, bangles, discs, wheels, pendants, lid, balls, toy can and fragments of animal figurines. It is interesting to note that the upper level of deposit yielded two indeterminate fragments of iron objects, beads of agate and jasper.

Phase II, of 1 m thick deposit, is distinguished by few pits, sherd of knife-edged bowls, *handi* and other variety of Sunga and Kushana affinity. A sherd of red ware bears a legend in Brahmi characters. The structural activity is marked by the occurrence of a circular fire-pit on the rammed floor, the top of which was edged with tapering mud bricks. Other finds of the phase included fragmentary terracotta figurines of human and animal, mould of human head, torso of Vishnu, toy-cart, beads, balls, bangles, wheel, gamesman, square and rectangular flesh rubber and other stone objects such as balls, weights, pestle and iron lumps.

Phase III yielded debris of medieval period, marked by structural activities. A covered drain was also unearthed. Besides, sherds of red and glazed ware were recovered in abundance from the upper level of the phase. The deposits of lower level show a distinct discontinuity, which suggests that the site was abandoned for unknown reasons.

84. EXPLORATION IN DISTRICT ALMORA.—In continuation of the last year's *{1986-87,* p. 75) exploration of the Gagas valley, Krishna Kumar Singh and Chander Singh of the Regional Archaeo logical Unit, Almora, resumed the work under the. guidance of Hem Raj. An ancient temple and sculptures of Vishnu and Surya assignable to medieval period were located at the village of Chhatgulla. Sculptures of Vishnu, Uma-Mahesha, Vinadhara Siva, Parvati, Saptamatrika panel and Ganesa, all datable to tenth-thirteenth century AD were also found at the villages of Kulshbi, Malli-Mirai and Redgal.

85. EXCAVATION AT JAINAL-NAULA, DISTRICT ALMORA.—The Department of Ancient Indian History, Culture and Archaeology, Garhwal University, carried out excavation at Jainal-Naula under the direction of K.P. Nautiyal, assisted by B.M. Khanduri, Vinod Nautiyal, R.C. Bhatt, D.L. Rajput, Y.S. Farswan, J.S. Rawat, J.S. Negi, K.S. Negi and G.P. Bahuguna.

The excavation conducted at the two places Sanana and Baseri falling in the Jainal-Naula complex, located at a distance of 10 km northwards of Bhikyasen revealed two types of burials, viz., the dolmenoid cist and urn-burial. At Sanana the two cist chambers with east-west orientation indicated that they were assembled in a rectangular form after a pit was opened out in the gravel section of the river bed. The situation at Baseri was somewhat different where almost all the cists were virtually hanging on the river section, that stands roughly 30 m from the present flood plain. This

indicated that the river has gone to a great depth reflecting thereby a continuous erosion coupled with a changing course brought it to the present position.

The details of the chambers indicate that they consist of three to six schist orthostats placed vertically according to the requirement. As indicated all the chambers were rectangular on plan with a required number of capstones covering the box-like structure, paaicularly for example in case of a cist, at least seven capstones were noticed to have been covering the burial chamber from one end to the other. The cist measured variously from 1-28 m x 0-40 m to 2-1 x 0-54 m and contained dishes and bowls including miniature bowls invariably deposited at the central axis or at the end of the chamber. At least 18 pots of various sizes, shapes and fabric were discovered from various chambers. The pots were characteristically placed inside the chamber on the flat stone slabs.

Most of the pots, broken due to a forceful penetration of underground rootlets, contained a sandy dark-brown clay along with the mortal remains in the shape of small bits of bones. In one case a femur bone measuring 11-3 cm along with a tooth kept in a pot was an important discovery. It seems that the practice of the dead body being excarnated first and then the left-over remains collected and deposited later in a pot was followed by the inhabitants. Due to an acidic soil, most of the bone remains are highly disintegrated.

Iron, though very scarce, was available during this time as this is proved by the discovery of two fragmentary iron pins, nail and a sickle but in the excavation no beads or any other grave goods was found.

Another characteristic find at Baseri is a group of um-burials. The large-sized handmade jars (50 cm diameter) contained prominent ripple marks on the outer surface. Interestingly at Baseri a dressed stone dividing wall measuring 5 metre and running north-south was purposely constructed at a later stage so as to draw a line of demarcation between a group of the three urn-burials and the twin cist chambers. This suggests that sucli a need was felt as the burial types might have belonged to two different groups of people. This, however, needs further investigations.

The unique feature of this excavation is the pottery type which is marked by the conspicuous absence of traditional Black-and-red ware. Instead, it is in the true tradition of the famous PGW culture of Ganga-Yamuna Doab showing it either grey or red with a grey core, having painted designs like horizontal, vertical and slanting strokes. In several cases the black rim-band is clearly discernible. A few red polished ware pots also contained ripple-marks. Most of the shapes of the pots are characteristically go closely akin to the types found in PGW level as reported from Hastinapur, Ahichchhatra, Jakhera, Thapli, etc., and other sites where the ware was found displaying prominent designs in association with a variety of red ware.

This evidence from Sanana and Baseri in Kumaun has thus thrown a challenge before the archaeologists for it has shown an altogether a new phenomenon of the two different cultural traits deeply intermingling with each other. Did the inhabitants imbibe certain traits from the PGW people, or were they contemporary to these people of the Ganga-Yamuna Doab are yet to be ascertained. '

86. EXCAVATION AT SRAVASTI, DISTRICT BAHRAICII.—In continuation of last year's work *(1986-87,* p. 76) the team under the joint leadership of B.S. Raman and Y. Aboshi, assisted by L.C. Singh, D.K!

Ambastha, D.K. Singh, R.S. Rana, S.K. Arora and Kishan Singh of the Survey and M. Yoneda, F. Tokuda, H. Kurogane, A. Oshita, H.N. Nakamura, Y. Harmatsu, E. Kubo, M. Hayashi and T. Lijima of the Kansai.University, Suita, Osaka, Japan resumed excavation at Jetavan (Sravasti). The main aim of the season's digging was to find out the details of the corner wall noticed earlier in the northwestern area of the mound and its relation with the structure nearby exposed recently and to establish the antiquity and the cultural sequence of the site.

The mound was divided into seven sub-divisions viz., A, B, C, D, E, F and G.

In area 'A' and 'B' on northwestern fringe of the mound, west of the Gandhakuti shrine, the corner wall noticed earlier was further exposed to discern a tank of Kushana period. The structure is rectangular on plan with an enclosure wall and has got three terraces (pi. XLI) of burnt brick structures. Number of courses exposed so far of the tank 42 with the maximum depth of the tank 2-30 metres from the top of the 1st terrace. A flight of steps was also noticed on the western side to reach the water level of the tank (pi. XLI I A). The brick sizes used in construction varied (33 x 25 x 6 cm, 33x21x6 cm, 48 x 23 x 7 cm and 49 x 24 x 7 cm). The area falling east of the tank revealed a stupa, almost circular on plan (pi. XLII B) with burnt brick paved square platform and two enclosure walls. The monastic cells appended to the stupa complex were exposed on three sides i.e., north, south and west, the construction of which was made in four successive phases corresponding to Kushana, Gupta, post-Gupta and early medieval periods.

In area 'C following the grid pattern only two quadrants viz., 3 of the square ZF 22 and Qd. 4 of the square ZE 28 were opened for vertical digging. The area falls on the peripheral zone of the site and its antiquity goes back to post-Gupta period only. The excavations in area 'D' by the side of the Chinese temple gate have revealed only a dump deposit.

In area 'E' marked near Anand Bodhi Tree, the structural activities ranging from Kushana to early Gupta and Gahadavala period were noticed. The area witnessed heavy pit activity. The size of the bricks exposed from Gupta levels measure 32-5 x 24-5 x 6-5 cm and 35 x 23-5 x 5 cm.The brick sizes noticed from Kushana level measure 44 x 24 x 8-5 cm and 41 x 23-5 x 8-5 cm.

From area 'F' of the site, a circular well with 72 courses of burnt brick exposed so far, was encountered in the 1st and 2nd quadrants of the trench YP4. The brick sizes noticed are 30-5 x 25-5 x 4 cm and 30 x 20-5 x 4-5 cm. At a distance of about 30 m westwards a monastic complex of the Kushana period with a central courtyard like platform and cells in a row, were exposed. In its second phase (Gupta period) of constructional activity, a temple having central chamber and a verandah in front, with east-west orientation, were also encountered. Above this were noticed the two arms of a wall (east-west and north-south) making an enclosure to an indiscriminate structure.

In area 'G' near the nursery of the Horticulture Branch of the Survey, structures of three successive periods have been encountered, corresponding to Gupta, post-Gupta and the early medieval period. From Gupta levels two burnt brick paved platforms have been noticed. In its successive phase, a burnt brick shrine with an opening towards west and a votive stupa to its south were noticed.The early medieval period of the structural remains were represented by two cells with a courtyard and verandah.

The pottery collected from 'A' and 'B' areas are mostly red ware of variant wash and slip and degenerated black slipped ware of the Kushana period. The fabric ranges from coarse to medium. The types include vase, carinated *handi,* bowl of different sizes, lid-cum-bowl, knobbed lid, spout with strainer back and sprinkler. The subsequent phase of pottery of the Gupta period is mostly red ware. A few sherds with moulded decoration were also noticed. The fabric ranges from medium to coarse and treated with vermilion red slip with mica dust on the exterior. The types represented were vase, *handi,* bowl, *lota,* lid-cum-bowl and storage jar, spouts having decoration of *makaramukha, varahamukha,* etc. The red ware and the coarse grey ware were continued in post-Gupta and the early medieval periods. This evidence has been corroborated from pottery finds in other areas, particularly areas 'E' and 'F'.

Antiquities collected from the excavations are mostly terracotta human and animal figurines, Naigamesha, inscribed sealing, terracotta bead, sprindle whorl, gamesmen, tile, some of them grooved, dabber, stamp, mould and terracotta ball, bangles of Kushana, Gupta and post-Gupta periods. A noteworthy find from the tank is a terracotta seven-headed serpent with thick black slip of coarser variety. The Gupta period has been marked by typical terracotta figurine (pi. XLIII A), female figurine with typical head dress, drapery and costumes and humped bull. Among the noteworthy finds, mention may be made of a terracotta head of Buddha (pi. XLIII B) and two inscribed sealings in early Brahmi characters of Gupta period (pi. XLIII C) with Prakrit language read as *Damesgutakaya.* The representation of mother with child in terracotta has survived in both the Kushana and the Gupta periods.

The present season's work brought to light four successive cultural deposits at the site. The site was in continuous occupation from Kushana to early medieval periods (i.e. first century AD to eleventh-twelfth century AD). The four successive cultural deposits are as under :

Period I : Kushana and late Kushana, *circa* first to third century AD.

Period II : Gupta, *circa* fourth to sixth century AD.

Period III : Post-Gupta, *circa* seventh-ninth century AD.

Period IV : Early medieval upto Gahadavala, *circa* tenth-twelfth century AD.

87. EXPLORATION IN PINDAR VALLEY, DISTRICT CHAMOLI.—R.K. Srivastava, assisted by B.P. Badoni and B.B.S. Rawat of the Hill Unit of Pauri Garhwal of Uttar Pradesh State Archaeological Organization, in the course of exploration, noticed several ancient temples. Among them the Govind group of temples at Simli near Nandprayag Tehsil is worthy of note and can be assigned to twelfth century AD. Among the sculptures Harihara, Parvati and Ganesa from Bengoli and Parvati and Yamuna from Cairoli are important.

88. EXPLORATION IN DISTRICT ETAWAII.—In the course of his explorations under village-to-village survey scheme, Suresh Singh of the Agra Circle of the Survey brought to light the following sites of archaeological interest :

Telisil	*Village/Site*	*Nature of remains*
	Aheripur	Medieval temple
Bharthana		
-do-	Asai	PGW, NBP and red ware
-do-	Bakewar	Medieval temple
-do-	Chakarnagar	PGW, NBP and red ware
-do-	Lakhna	Medieval temple
-do-	Mahewa	Medieval temple
-do-	Mamen	PGW, NBP, black-slipped and red ware
-do-	Pirthi Rampur	Black-slipped ware and red ware
-do-	Rataur	Medieval temple
-do-	Sarsainagar	Medieval temple
-do-Eta	Ujhani	Medieval temple
wah	Chakwabuzurg	Medieval temple
-do--do--d	Dugaoli	Medieval temple
o--do-	Laungpur	Medieval temple
	Pachdeora	Medieval temple
	Umrai	Medieval temple

89. EXPLORATION AT HASWA, DISTRICT FATEIIPUR.—Krishna Kumar of the Museums Branch of the Survey noticed three copper celts and one anklet in a private collection at Allahabad. All the celts are broken into pieces and two of them bear round indentation marks. These objects were found by the labourers while digging a pond at Haswa situated at a distance of 6 km, east of the District Headquarters.

90. EXPLORATION IN DISTRICT NAINITAL.—Under the village-to-village survey scheme, Krishna Kumar Singh of the Regional Archaeological Unit, Almora explored 190 villages in the vicinity of Pyuda, Betalghat and Bhawali and brought to light sculptures of Vishnu, dancing Siva, Ganesa, Parvati, Mahisasuramardini and Lakshmi-Narayana ranging in date from the tenth to thirteenth century from Pyuda, Damyanti, Rawat and Naukuchia-tal and an image of twentytwo-armed Durga datable to ninth century AD from Amel near Betalghat.

91. EXPLORATION IN DISTRICT PITHORAGARH.—In continuation of previous year's work *(1986-87,* p. 83) Hem Raj of the Regional Archaeological Unit of the State Archaeological Organization, Almora, resumed exploration in Tehsil Champawat and about ninety villages in the vicinity of Barakot, a block headquarters, and brought to light two stone images of Vishnu belonging to medieval period at Pamda and Kakad, three monolithic votive pillars bearing inscriptions in Devanagari and carvings of various figurines at Barakot, remains of an ancient temple site near Kalakot.

92. EXPLORATION IN DISTRICT SULTANPUR.—Indu Prakash of the Lucknow Circle of the Survey, discovered a mound at Naraini in the Amethi Tehsil. The mound has yielded pottery ranging from NBP to medieval red ware.

WEST BENGAL

93. Exploration in District Bankura.—In the course of village to village purvey, T.J. Chakraborty of the Calcutta Circle of the Survey discovered the following sites of archaeological interest:

P.S.	*Village/Site*	*Nature of remains*
Kotulpur	Bagrol	Late medieval temple
-do-	Deshra	Late medieval temple
-do-	Ganti	Late medieval Siva temple
-do-	Jalitha	Late medieval Siva temple
-do-	Madanmohanpur	Late medieval Durga temple and Rasa mancha
-do-	Shironmanipur	Late medieval Siva temple

94. EXCAVATIONS AT KOTASUR, DISTRICT BIRBHUM.—The Department of Ancient Indian History, Culture and Archaeology, Visva-Bharati, Santiniketan, under the direction of N.C. Ghosh and Arun Nag, assisted by Kapil Muni resumed excavation at Kotasur with a view to establish the sequence of cultures broadly indicated in the previous season's repon *(1986-87,* pp. 95-96). The excavations were confined only in two trenches within the fortified area. The first trench, measuring 3 m x 5 m, was an extension of the previous year's trench laid on the northern part of the mound. The third trench, measuring 3 m x 3 m was laid on the southern slopes of the hump marked by a modern Siva temple on it. The cultural accumulation is divisible into five broad periods.

Period I is distinguished by the NBP and other associated wares. The NBP, however, appears at the site when the thickness of the initial deposit reached 30 cm above the natural soil. The ware is inferior in quality and limited in quantity in comparison to the specimens from the sites in the middle Ganga plains from this level. Indeterminate iron objects and beads of terracotta were recovered. Except a couple of rammed floor levels of mud the evidence of structures is absent.

Period II is marked by the presence of fragments of moulded terracotta female figurines, ascribable to Sunga craftsmanship. The typical bowls and other types mainly in plain red ware from this level are also comparable with the shapes from the identical horizon in other sites.

The structural remains are mainly represented by a few floor levels with post-holes.

Period III is represented by red ware often treated with thick bright red slip. The pottery types include bowls, basins, ring-handle, pans, vases and jars. Two baked brick walls of one and half course in width from this level in the limited area of the excavation are noteworthy. On the basis of pottery and antiquities the Period IV may be dated to fourth to eighth century AD. The deposit contains silt

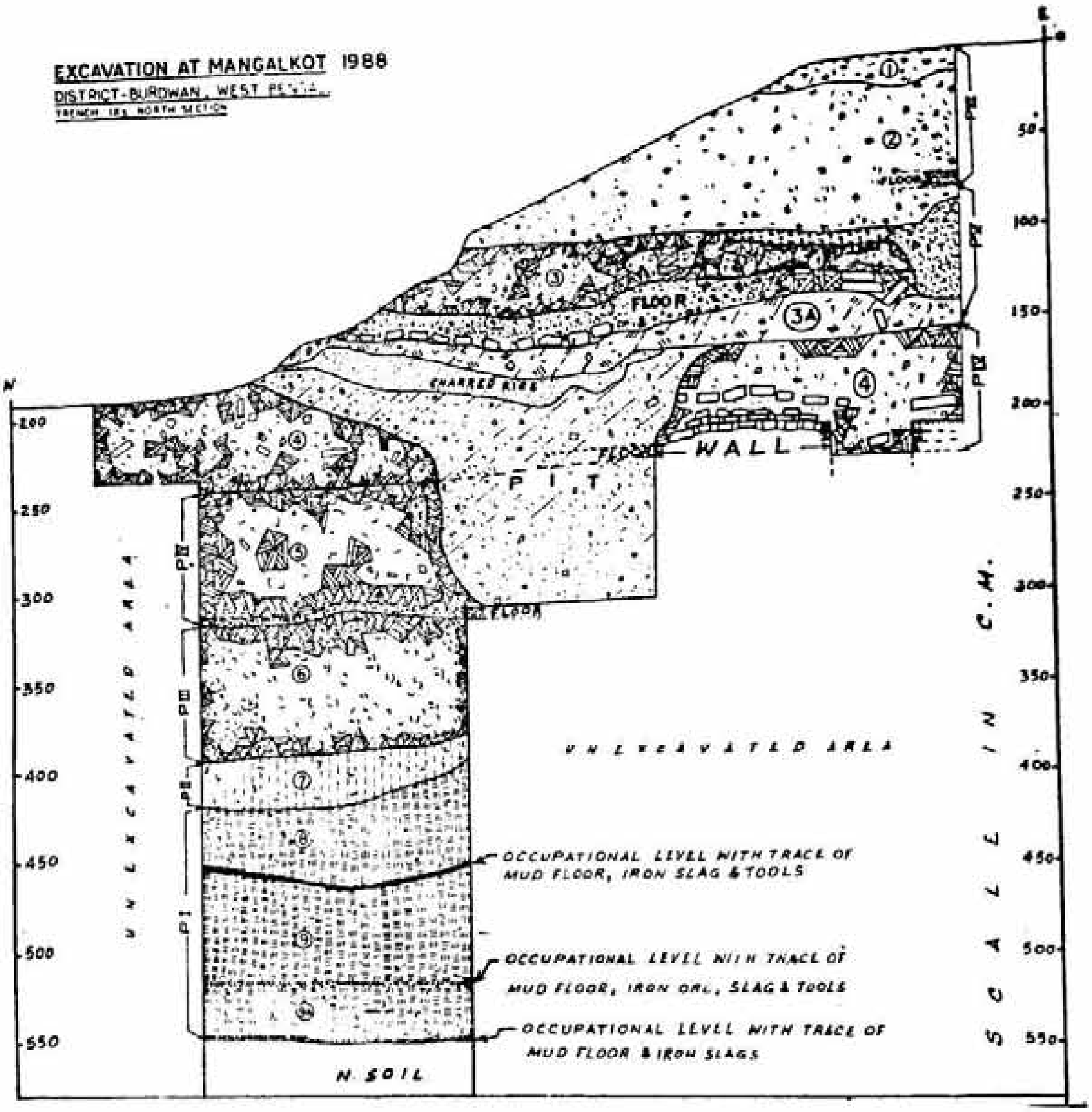
and sand in appreciable measure suggesting a prolonged stagnation of water. Period V was badly spoiled by brick robbing. The depredation is so extensive that nothing worthwhile was recovered from the above two cuttings.

A few punch-marked coins were found from the disturbed horizon, nearly 30 cm below the eroded surface of the trench laid on the northern face of the mound marked by a modern Siva temple on the top. At least two coins bear representation of boat/ship besides, sun and six-armed symbols.

95. EXCAVATIONS AT MANOALKOT, DISTRICT BURDWAN.—In continuation of the last season's work *(1986-87,* pp. 96-98) the excavation at Mangalkot was resumed by the Department of Archaeology, Calcutta University, under the direction of Amita Ray, assisted by Samir K. Mukherjee, MallarMitra, A. Datta, B. Chatterjee, P. Ghosh, N.C. Das and D.K. Chakravarty. The main objectives of this year's work were to ascertain the position of iron in the Chalcolithic period with a view to determining the cultural phases of the chalcolithic occupation ; to reconfirm the transitional phase between the chalcolithic and the so-called Maurya-Sungd period which was brought to light during the last year's excavation; and to determine the interconnection between structural activities with the successive cultural periods. Accordingly, three trenches were laid on two mounds namely Viramadityer Dhibi and Madrasa Danga in trenches-C'6 and IX 3 in MGKT-1 and trench-A'l in MGKT-2 series.

Digging revealed six cultural periods, viz., Chalcolithic (1200-700 BC approximately), Transitional (700-300 BC), Sunga (300 BC-first century BC), Kushana (first-third century AD), Gupta (fourth-sixth century AD) and post-Gupta (sixth-seventh century AD) and period ranging in date from the eighth to the eighteenth century AD (fig. 24).

Excavation in the trenches IX 3 (layers 8,9 and 9A) and A' 1 (layers 9 and 10) brought to light two metre thick deposit of Chalcolithic period (on an average depth 4-50 m below surface), revealing a large quantity of black-and-red ware, shapes of which are lipped bowls, dish-on-stands, channel-spouted bowls, vessels and basins with perforations, carinated bowls, rimless bowls, jars, basins and *handis.* Besides, black-slipped, red-slipped, cream-slipped, chocolate, dark-red, dark-brown, ochre-red and black-mat-red and grey, and huge amount of pale-brown pottery for various domestic uses have been found in the assemblage. Painted pottery is frequent, showing geometric designs in white on black and black-on-red and red-on-cream. Some designs made by grooving and incised decorations, have also been noticed. Other finds included terracotta discs; bangles in terracotta and copper; beads of semiprecious stones, terracotta and copper; fragments of copper, including a fish-hook and lumps; and iron slags along with a new undifferentiated iron objects. It may be mentioned that the use of iron has been noticed in the lowest habitational layer, almost on the virgin soil, and thus periodising the entire cultural period as I, not I and II as was done last year on the basis of the occurrence of iron. The tool-kit comprises a profuse number of bone points, blades, daggers and scrapers and a knife made of tortoise shell besides a microlithic core with flaking marks. Other notable antiquities are one terracotta figure with applique decoration, terracotta game objects and net-sinkers, patches of rammed mud floors in two successive layers have been laid bare in 1X3 and one floor in A'l with fire-pits. The total habitational deposit in both the trenches consisted of two primary layers.



EXCAVATION AT MANGALKOT 1988
FLOOR
CHARRED RIBS
WALL
PIT
FLOOR
UNEXCAVATED AREA
UNEXCAVATED AREA
OCCUPATIONAL LEVEL WITH TRACE OF MUD FLOOR, IRON SLAG & TOOLS
OCCUPATIONAL LEVEL WITH TRACE OF MUD FLOOR, IRON ORE, SLAG & TOOLS
OCCUPATIONAL LEVEL WITH TRACE OF MUD FLOOR & IRON SLAGS
N. SOIL
SCALE IN C.M.

FIG. 24

Period II (trench 1X3, layer 7; trench A' 1, layer 8) representing the transitional phase, is marked by a habitational deposit of 60 cm, yielding black-polished ware, grey ware, brown ware, ochre-red colour, including a red-slipped terracotta figure of the ageless type. The earlier bone industry together with some amount of black-and-red ware and ochre-red and grey coloured pottery continued in this phase. This period has been confirmed as a period of transition as evidenced by the overlap between the new ceramic industry and the earlier black-and-red ware and associated pottery and tool-kits.

Period III, with a maximum depth of 1 m in trench IX 3, layer 6, is characterized on the one hand by the absence of black-and-red ware, and on the other by the occurrence of a few pieces of the thick variety of NBP sherds and black-slipped, grey brown-coloured and mat-red wares. The finely polished black-slipped ware has been found in the shapes of bowls with slightly convex body (pi. XLIV A). Noteworthy among other finds are cast coins of square and circular varieties; copper locket; bangles of copper and terracotta; beads of semiprecious stones and terracotta; one terracotta mould; two terracotta figurines (pi. XLIV B) depicting a *Vrikshaka* figure and *panchachuda yakshini* of the typical Sunga characters and few pieces of decorated flesh-rubbers. A floor made of rammed earth and sherds has been traced in IX 3, on the top of layer 6.

Period IV, having a maximum depth of 2 m in trench A'l, layers 5 and 5A and 1-54 m in trench IX 3, layers 5 and 4, is marked by a spurt in structural activity of well-burnt bricks (24 x 26 x 6 cm; 38 x 28 x 5 cm; 40 x 27 x 7 cm), and is divisible into two phases. This division has been done on the basis of floor made of rammed brick jelly, mixed with sand, potsherds and clay. A floor composed of brickbats, sand, clay, rammed brick jelly and potsherds having a thickness of 10 cm has been found as a ceiling layer above the well in layer 5A. The most interesting structure of layer 5A (A' 1) is a massive well (pi. XLV A). This structure on excavation was found to be well preserved brick well with inner diameter measuring 85 cm and outer as 1-85 m. The well has been excavated to a depth of eight courses without reaching the bottom. The average size of the brick used in the well is 26 x 24 x 6 cm. The principal ceramic industry is a fine well-fired hardy red ware of thick and thin fabric. The forms represented in this ware are known Kushana types like the big and small pans with handles with punched designs, vases with affixed short cylindrical spout, sprinklers, incense-burners, high necked *surahis,* big shallow bowls with upturned flat thick rims, footed bowls of various sizes with intumed rims (pi. XLVI A). The design repertoire consists of bands, incised and stamped designs and wavy pattern on the rim. The period is characterized by various kinds of copper objects like ring, snake shaped bangles, finger rings, bowls, ear-ring, antimony rods and a needle; iron nails; beads of glass, stone and terracotta; net-sinkers; finely-polished pestle stories; and a few terracotta figurines of both solid types and moulded ones representing figures (pi. XLVI B) of the typical Kushana stylistic affiliation (IX 3, layer 4; A' 1, layer 5 and 5A; C 6, layer 4). Layer 4 in trench C 6 has laid bare a round hollow head characterized by open eyes, parted lips, lit with a peculiar demonic smile. Cast copper coins continued to occur in this period. This period laid bare in Trench IX 3, layer 4, a 8 cm thick deposit of charred rice of finer quality. The period may be ascribed to the Kushana phase.

Period V, belonging to the Gupta period, is characterized by the occurrence of red, buff, grey-black and cream wares with slip and wash, typical of the Gupta time (pi. XLVI C). The deposit varies in depth ranging form 1 m (IX 3, layer 3 and 3A) to 1-10 m (C 6, layer 3; A'l, layer 4). The period

shows widespread structural activities (pi. XLV B). The houses were built of bricks differing in sizes oetween 18 x 24 x 8 cm, 35 x 25 x 5 cm and 24 x 26 x 6 cm. At least one trench provides an interesting clue regarding structural work. The bricks are found to have been laid in clay mortar, over a foundation of broken bricks. The top of the floor was then made of rammed mud, broken potsherds and lime (trench IX 3, layer 3). The discovery of huge-sized nails found in this level clearly indicates their use for constructional purposes. Noteworthy finds of this period are one terracotta figure and a number of inscribed seals and sealings. The most popular symbols are *purna-kumbha,* a tree with a *kumbha,* a woman standing akimbo and two cast coins one from trench IX 3, layer 3. The evidence of several unfinished beads, flaked stones and finished beads in semiprecious stone, glass, crystal found in this level implies local manufacture.

Period VI (layer 2 in all the trenches) is represented by a few floors of mud and brick-bats. It reveals a large number of red.brown, grey and black wares. Accumulated materials show varied types of pots which include bowls, basins, *handis,* vessels, vases, shallow dishes of various sizes and shapes. Other objects of this period are terracotta figurines, bangles, net-sinkers, beads of varied shapes in terracotta and stone. The period has revealed two pieces of Muslim coins, one coin of the East India Company and a few pieces of porcelain.

Exploratory digging was taken up at a place called Aral, revealing a 4-80 m thick deposit belonging entirely to Muslim occupation. The period is characterized by glazed ware, red-slipped ware, a few pieces of porcelain and black-slipped shallow dishes with painting in white.

The trial trench laid at Kogram on the opposite bank of the Kunur has revealed a deposit containing materials of the post-Gupta period. The pottery which was mainly of red colour shows different types of utilitarian objects. The other objects include beads of stone and terracotta and terracotta figures of the timeless variety.

96. EXPLORATION IN DISTRICT MIDNAPUR.—In the course of village to village survey, Santanu Maiti of the Calcutta Circle of the Survey, discovered the following sites :

PS-	*Village/Site*	*Nature of remains*
Bhagbanpur	Arjun Nagar	Temple assignable to late eighteenth century
-do-Egra	Shimulia	Temples and image of Tara
-do-	Aklabad	Image of Vishnu datable to eleventh century
	Kasba	Temple datable to thirteenth century

97. EXCAVATION AT BALLALDHIPI, DISTRICT NADIA.—In continuation of the previous year's work *(1986-87,* pp. 99-100) the Calcutta Circle of the Survey under S.S. Biswas, assisted by D.J. Das, T.J. Chakraborty, S.K. Kundu, S.K. Ghosh, P. Das and B.N. Chatterjee, resumed excavation at Ballaldhipi with the aim to expose the entire outer wall on the eastern side of the temple complex; to find out the

entrance to the temple complex from the habitational (east) side; and to expose the main entrance of the temple complex on the western side. The compound wall of the temple complex on the eastern side were fully exposed and an entrance have been traced. However, the main entrance of the western side of the temple could not be traced due to extreme erosion of the river. The central chamber was exposed, and the excavation encountered another floor which was constructed with big size bricks (35 x 25 x 5 cm) which appear to be of earlier period. However, we could not find any evidence from which the religious nature of the temple could be ascertained.

II. EPIGRAPHY

SANSKR1TIC AND DRAVIDIC INSCRIPTIONS'

ANDHRA PRADESH

1. KALYANI CHALUKYA INSCRIPTION, HEMAVATI, DISTRICT ANANTAPUR.—This inscription is in Kannada language and characters and belongs to the reign of Tribhuvanamalla Vira-Somcsvaradeva (Somesvara IV) and is dated Saka 1107 (AD 1186). It refers to the king's feudatory *Mahamandalesvara* Bhogadeva-Cholamaharaja as governing from Hencheru (modem Hemavati) and contains the eulogy of the Jaina saint Padmaprabha Maladharideva, the disciple Viranandi Siddhantachakravarti belonging to Desi *gana.*

2. COPPER-PLATES, CHAMARRU, DISTRICT GUNTUR.—These undated copper-plates issued by Sri Jayasingha- Vallabha I (AD 640-670) of the Chalukyan lineage who bore the title Sarvasiddhi register the gift of the village Vilenti as in the Natavati *vishaya* situated on the northern bank of the river Krishnabenna as an *agrahara* to the brahmana Svamisarman of *Koisasa-gotra.* The record is in Sanskrit language and engraved in Telugu-Kannada characters.

3. TELUGU INSCRIPTION, VINUKONDA, DISTRICT GUNTUR.—This inscription, inTelugu language and characters, is engraved on a *naga* slab kept outside the Ranganayakasvami temple in the village. Dated Saka 1319 (AD 1397), it.states that Jakaya Proliseti caused the excavation of a tank and raised a garden for the merit of his father Jakki-seti and mother Limgasani and of the kolalvarv

4. VIJAYANAGARA INSCRIPTION, VINUKONDA, DISTRICT GUNTUR.—This inscription, in Telugu language and characters, is engraved on a slab built into the P.W.D. building. Dated Saka 1483 (AD 1561), it refers to the rule of the Vijayanagara king Sadasivadeva-maharaya and to the *dharmasasana* issued to Kondappa, grandson of Rayana Bhaskaruni Annamaraja of Vasishtha-gorra, Asvalayana *suira* and Rik *sakha,* by Kumara Kondarajayyadeva, son of Venkatesvara and grandson of- *Mahamandalesvara* Ramaraju Peda Kondrajayya, belonging to Soma *vamsa, Axreya-gotra,* Apastamba *sutra* and Yajus *sakha.* It seems to register the gift of *eka-bhoga* villages, temple yllages in *sima, vrittikshetra* in the *agrahara,* dry lands, wet lands and gardens in the *amara-vumbali* villages along with other privileges as *sarvamanya* by Kondrajayya to the deity Ragunayaka consecreted in the temple of Vitthalesvara at Vinukonda, on the bank of Tungabhadra, on the occasion of lunar eclipse.

'Information from: K.V. Ramesh, assisted by Madhav N. Katti, M.D.Sampath, S.P. Tewari, C.R. Srinivasan, S. Subramonia Iyer, N. Nanjunda Swamy, Vcnkatesha, CAP. Sastri, D.M. Nagaraju, S. Nagarjuna, S. Swaminathan of the Epigraphy Branch of the Survey, Mysore, who found, examined and reported nearly one hundred and fifty inscriptions of which the important ones are noticed here excepting item nos. 2 and 11 from Archaeological Museum, Amaravati 7-10 and 12-13 from the Department of Archaeology and Museums, Government of Andhra. Pradesh, 14-16 and 18 from Department of Archaeology and Museums, Government of Kamataka and 25-34 from State Archaeology, Government of Manipur.

5. INSCRIPTION OF RECHERLA CHIEF, ANASAGAR, DISTRICT KHAMMAM.—This Telugu inscription, engraved on a stone kept in front of the Mutyalamma temple, is dated Saka 1144 (AD 1222) and refers to the rule of *mahamandalika* Recherla Kataya. It also registers the grant of one *mattar* of land each to the temple of Ramanathadeva, Adikesvaradeva and Mahesvaradeva constructed along with a tank at Rudrasamudram by Govimdamamchidevisetti.

6. INSCRIPTION OF RECHERLA CHEF, NELAKONDAPALLI, DISTRICT KHAMMAM.—This inscription, in Telugu and Sanskrit languages a^nd Telugu characters, is engraved on a slab kept in front of Kattalammacheruvu. It is dated Saka 1164 (AD 1242) and registers the gift of two *maruturus* of land at Bollasamudram to the temple of Prolakamma at Kondapalli by Recherla *pasayita Ganap&ti-raddi,* a *mahamandalesvara* of Kakatiya Ganapati. It also registers a gift of 20 *modalu* for securing ornaments and articles of worship and rice for food-offerings to the goddesses Prolakamma and Marakamma. Proleboya is referred to as the composer of the inscription.

7. INSCRIPTION, PIPRI, DISTRICT MEDAK.—The inscription records the grant of the revenue income from *siddaya* to a priest named Ikeya by the Prabhumukhyas of the *grama* headed by Avocharavutu. It is datable to tenth century AD.

8. INSCRIPTION, NAGIREDDI-PALLE, DISTRICT NALGONDA.—The inscription is in Kannada script and language and records the gift of 50 *manors* of land, measured by the *rajamana,* by one named Bureyarasa, son of the lady Vijayakabbe of Pulakaturu. It is datable to eleventh century AD.

9. INSCRIPTION, HANUMASAMUDRAPET, DISTRICT NELLORE.—Dated Saka 1165 and belonging to the Telugu-Choda king Trikalatideva, the inscription records the achievements of the king. It mentions the measuring rod called *Jana* of Atmakuru and also gives several terms regarding tenancy.

10. Two KALYANI-CHALUKYA INSCRIPTIONS, DURKU BANSWADA, DISTRICT NIZAMABAD.—One of them in Kannada verse, belongs to the time of Tailapa II of the Kalyani-Chalukya dynasty. It records the gift of an *agrahara* to the family preceptor Chandrasi. Another record belonging to the Kalyani Chalukya king Tribhuvanamalla is dated Chalukya-Vikrama 44 (AD 1119) and registers the gift of land by the *mandalikas* to Gondabhatta of Abduda on the occasion of *Uttarayana Sankranti* by the queen Piriya Ketaladevi of Kalachuri dynasty.

Another record, dated Saka 1147 and belonging to the time of Kakatiya Ganapatideva, is in Kannada language and characters. It registers the gift of land to God, Madesvara, at Devarahalli and also to the maintenance *of matha* attached to the temple by the subordinate Pentamala Rudranayaka ruling from Potalakereya.

11. FOUR SETS OF COPPER-PLATK INSCRIPTIONS, DUDDUKURU, DISTRICT PRAKASAM.—Of the four sets, two belong to early Chalukyas of Vengi and the remaining two to the early Pallavas. All of them are in Sanskrit language and characters.

One of the two Chalukyan grants in three plates was issued in his second regnal year (AD 682) by Sarvalokasraya Maharaja, identifiable with Mangi Yuvaraja (AD 681-705) who bore the titles Sarvalokasraya and Vijayasiddhi. It registers the grant of two pieces of land measuring forty *nivartanas* in the village Petcherukuru situated in the Karmarashtra to two Brahmanas named Golasarman of Kaundinya-gerra and Vinayasarman of Bharadvaja-go/ra.

The second set, which also consists of three plates, was issued by Sri Sarvalokasraya Sri Vishnuvardhana Maharajadhiraja Paramesvara Bhattaraka,*who is identifiable with Vishnuvardhana IV who also bore the title Sri Vishmasiddhi and ruled over Vengi between AD 771 and 806. It registers the grant of the village Senavurabu included in the Pallirashtra-Vfa/iaya to the Brahmana named Yajnamandatredibhatta-sarman of *Axreya-gotra* and Apastamba-sufra on the occasion of solar eclipse.

The third set records the grant of some pieces of land in the village Ikshugrama situated in Karmarashtra to a certain Brahmana, name not clear, by Maharaja Sri Vishnu-gopavarman of the Pallava lineage and Bharadvaja-gorra, son of Maharaja Simhavarman and grandson of Vishnugopavarman. The grant is dated in the seventh regnal year of the king and on the tenth day of the bright fortnight of the month of Margasirsha. The weekday was Budhavara with Rohini *nakshatra.*

The fourth set records the gift of 2008 *nivartanas* of land as *brahmadeya* in the village Peruvatukuru situated in Karmarashtra by Maharaja Sri Mahendra Vikarmavarman, son of Maharaja Sri Simhavishnu-varman and grandson of Simhavarman of the Pallava lineage and Bharadvaja-gof *ra.* The donors of the gift were 93 *brahmanas* of different *gotras* and *charanas* who were well-versed in one or more Vedas and Vedangas, Itihas, Puranas and Dharma Sutras. It is dated in the 23rd regnal year of the king, on tht fifth day_of the bright fortnight in the month of Chaitrai the week day being Monday and *nakshatra* Rohini.

12. MISCELLANEOUS INSCRIPTION, PALLESANKARAPPALLE, DISTRICT RANGA REDDY.—The inscription is in Halekannada script and language and records the gift of land to the god *(Degula)* of Prutuvipuri of Chedipa village. It is assignable to the tenth century AD.

13. INSCRIPTION, KASIM KOTA, DISTRICT VISHAKHAPATNAM.—Belonging to the time of Velanati chief Prithivesvara (Saka 1114=AD 1192), the inscription records the gift of wet land to the god Janardana of Munumgupaka by Narasayanayaka of Dimiti, the chief of Prithvesvara for the merit of Jayama, queen mother of Kulottunga Prithvesvara..

KARNATAKA

14. COPPER-PLATE INSCRIPTIONS, ANEGUNDI, DISTRICT BELLARY.—A set of eight copper-plates was unearthed in a field near the gate 'Kadebagilu' at Anegundi (pi. XLVII). Five plates are in good condition and three plates are broken. The record can be dated to twelfth-thirteenth century and is in Kannada characters. It contains an abridged version of 'Girija Kalyana' describing the marriage of Siva and Parvati and of the story of Amritamanthana.

15. VIJAYANAGARA INSCRIPHON, BUKKASAGARA, DISTRICT BELLARY.—Belonging to the reign of Krishnadevaraya, this Kannada inscrintion records the gift of land to Prabhakara Bhatta in Bukkasagara.

16. VIJAYANAGARA INSCRIPTION, BALAVADDIGERI, DHARMASAGARA, DISTRICT BELLARY.—Belonging to the reign of Krishnadevaraya, this Telugu inscription is dated AD 1517 and registers the grant of village 'Dharmasagara' to Sakapati Nayaka.

17. NOLAMBA INSCRIPTION, NANDI, DISTRICT KOLAR.—This inscription, in Kannada language and characters, is engraved on a slab set up to the north of the *prakara* in the Bhoganandisvara temple in the village. It refers to the rule of Nolambadhiraja and registers a grant to Divyasaktipanditadeva by Mayda-gamunda, the *padamula* and the twelve *gamundas.* The grant consisted of seven *khandugas* of paddy field purchased by payment of gold from the holdings of the original tenant Puliyanna in Nandiyavarana, the village Tondapatturu and a tank.

18. HOYSALA INSCRIPTION, MURUKANAIMLLI, DISTRICT MANDYA.—Belonging to the reign of Hoysala Vishnuvardhana, this Kannada inscription is dated in Saka 1052 Sadharana Samvatsara Pusya Su 13 (AD 1130) and records the grant of land to the temple by Muddanna, son of Rachasetti and Muddamma.

19. RASHTRAKUTA INSCRIPTION, KALMALA, DISTRICT RAICHUR.—This inscription, engraved on a slab set up in front of the Bhogesvara jemple in the village, is in Kannada language and characters. Dated Saka 861 (AD 939), it refers itself to the reign of Rashtrakuta Kannaradeva (i.e. Krishna III) and registers a gift of 34 *mattars* of land, measured by *rajamana,* to the deity Mallikarjunadeva by [Chu] ttaransaru and Pittabbe, on the occasion of *Uttarayana-sankranti.* The gift appears to have been entrusted to Kalmaleyaditya-bhatara. The record also mentions Devarasibhatara and Ganga-Rachyaya.

20. KANNADA INSCRIPTION, ISUR, DISTRICT SHIMOGA.—This inscription in Kannada language and characters of the ninth century, is engraved on a pillar found in this village. It seems to state that Arasar Bo|Po?J dakojari got this temple converted into a Vishnu temple and granted one-sixth share of Konegeri village to this temple. The remaining portion was endowed for the services of the deities Mahadeva and Vishnu.

21. CHALUKYA INSCRIPTION, MALLENAHALLI, DISTRICT SHIMOGA.—Of the two inscriptions engraved in Kannada language and characters of about the seventh-eighth century AD, on a pillar found in the village, the first record mentions Dosiyara as the governor of the province of Banavasi-twelve thousand under Kirtivarman's rule and record the gift of uncultivable and cultivable lands as well as *gosasa* by Devaman, who obviously belonged to a family called Vichchira (See *J.E.SJ.,* Vol. XIV, pp. 73-75).

The second record refers to the rule of Chalukya king Kirttivarmma-maharaja under whom Dosi-Sinavtara was governing the Banavasi-twelve thousand province. Bichchara-vasa is stated to have granted uncultivable and cultivable lands from the village Devagi and also a tank, for the maintenance of the temple Sri Karigudi.

22. KANNADA INSCRIPTION, MAIXENAHALLI, DISTRICT SHIMOGA.—This inscription, in Kannada language and characters of about the eighth century AD and found engraved on a rectangular stone mentions Marakke-arasa as the ruler of the *nadu* and Kesugallara Siriyamma as the administrator of the *uru.* It also refers to a certain Alamara-Gangeya of Madera family and a Bichchara-Parggalan (See *J.E.S.I.,* Vol. XIV, pp. 74-76).

MADHYA PRADESH

23. THREE INSCRIPTIONS, JEERAN, DISTRICT MANDASAUR.—Engraved on two beams and on a pillar in Bhanatiket-ki-Chhatri, these inscriptions are in Sanskrit language and Nagari characters. The first record, dated Vikrama 1063 (AD 1006), records the gift of a pillar *(mahadhara-stambha)* in the edifice of the Sun god by *Maharajnve* Saravvadevi, the wife of *mahasamantadhipaii* Vigrahapala, who belonged to the Guhila family, who was an emigrant from Nagahrada-sthana and who was administering Devahulika-b/m&n and the daughter of *mahasamantadhipati* Vasanta, for the reduction of demerits *{karmakshaya).*

The second record, dated Vikrama 1066 (AD 1009), records the gift of a pillar *(mahadhara-stambha)* by *maharajni* Jujuka, the wife of *mahasamantadhipati* Vigrahapala of the Guhila family and the daughter of *mahasamantadhipati* Devaina who belonged to the solar family, who was an emigrant from Bharakachchha, for the Sun god, for the reduction of demerit *(karmakshaya).*

Another record, bearing the same date, records the gift of the beam *(mahadhara-patta)* by the queen Jujuka referred to above. *Mahasamantadhipati* Vatsaraja, referred to as the grandfather of queen Jujuka, is described as offering perpetual obeisance.

MAHARASHTRA

24. KANNADA INSCRIPTION, BHINGOLI, DISTRICT LATUR.—This incomplete inscription (pi. XLVITJ. A), in Kannada language and characters, is engraved on a slab fixed at the entrance of Hanumanji-mandir. It is dated in the second regnal year (AD 1176-77) of the Kalachuri king Sankaradeva and refers to the rule of Kesimaya-dandanayaka over Homnoduru seven to a half division. The latter is credited with epithets like *Lala-Kamnnada-samdhivigrahi, Bhattara-niyogadhipati,* etc.

MANIPUR

25. INSCRIPTION, KUMBI, DISTRICT BISHENPUR.—This inscription, in archaic Meitai script and language, records the name of king Pamhaipa.

26. CHIBU INSCRIPTION, TONJANG, DISTRICT CHURACHANDPUR.—This inscription, in Assamese/ Bengali script and Manipur language, records the victory of king Chandrakirti over the rebel chiefs of Lushai in AD 1872. It refers to the subjugation of 112 villages and capturing of 4 Lushai chiefs in the course of an expedition led by Souwaijamcha Balaram Singh Major and Kangabam ChaThangal

Major assisted by one British officer. A mythical unicom animal is also found engraved on the lower part of the inscribed stone. A pair of big foot prints on a large stone slab is lying just in front of the inscribed stone.

27. INSCRIPTION, ANDRO, DISTRICT IMPIIAL.—This inscription, dated in Saka 1?44 (AD 1822) and in archaic Meitei script and language, is the royal edict of the king *Ching-Khomlel Pamheipa Nongpok Wairang Lamlokpa* (king Jadu Singh). It also refers to the administration of Andro village located on the eastern pan of his domain.

28. INSCRIPTION, KONTHOUJAM, DISTRICT IMPHAL.—This inscription in -archaic Meitei script and language records names of king Khagingamba and Charairongba.

29. HKISNAM LAIREMMA INSCRIPTIONS, IMPHAL, DISTRICT IMPHAL.—Dated in Chandrabda era 1040 (AD 1819) the first inscription, in archaic Meitei script and language, records the inauguration of the temple- of Heisham Lairembi (family deity of Heisnam clan) by *Meithingu Chinglen Nongtarel Khompa* (Maharaja Gambhir Singh). The second inscription, dated Saka 1765 (AD 1844) and in archaic Meitei script and language records the laying of the foundation stone for the construction of the temple of Heisnam Lairembi (the family deity of Heisnam clan) by *Lairel Nonglel Seltreng Manik Khomba* (Maharaja Narasingh).

30. LEISHANGKHONG INSCRIPTION, WANGOI, DISTRICT IMPHAL.—This inscription is written in both archaic Meitei and Bengali script and records the inauguration of the market place known as *Mayang Ngamba Keithel* by Maharaja Birachandra Singh, *Nongpok Wairang Pamheiba* (Maharaja Marjit) in Saka 1741 (AD 1819). The text was composed by Lairikyengba Shridananda and Parshuttama.

31. INSCRIPTION OF MAHARAJA CHOURAJIT, AWANG KHUL, DISTRICT TAMENGLONG.—Dated in Chandrabda 1025 (AD 1825) and in Assamese/Bengali script and Meitei language, it records the name of Maharaja Chourajit as Shri Jukta Manipureswar Chourajit *Maharaja Meidingu Nongpok Wairang Pamheipa.*

32. INSCRIPTION, NUNGBA, DISTOICTTAMENGLONG.—This inscription in (probably) Kabui language is composed of five lines.

33. INSCRIPTIONS, KAKCHING KHOUNOU, DISTRICT THOUBAL.—These two stone inscriptions are in archaic Meitei script and language and record the names of some important persons of the locality.

34. INSCRIPTIONS, NINGEL, DISTRICT THOUBAL.—Of the two stone inscriptions, the first one, dated in Saka 1665 (AD 1743) is in the archaic Meitei script and language. It records the villages on the eastern part of the domain of king Garibaniwaj (AD 1709-48) and the names of the village chief and many high ranking officials. It also states the grave consequences that the surrounding hill tribes

might suffer if they harassed, tortured and raided the villages and villagers under the protection of the King Garibaniwaj. The text was composed by Yimnam Arei and Yaosom Kasom, and Saikhom Sangkoi was the engraver.

The second inscription in Meitei language and Assamese/Bengali characters is dated AD 1814. It records the name of King Marjit (AD 18.13-19) and some of his officials.

TAMIL NADU

35. KONGU-CHOLA INSCRIPTION; SEVUR, DISTRICT COIMBATORE.—This inscription, engraved on the east wall of the *ardha-mandapa* of the Kapalisvara temple, is in Tamil language and characters (pi. XLVI1I B). Dated in the twentieth year (AD 1226-27) of the reign of the Kongu-Chola king Virarajendra, it registers the grant of a *Kalanju* of gold for the twilight lamp to the deity Aludiayar Tirukkapalisuramudaiyar by Araiyan Valli, servant-maid of the queen Vanavan Mukkorkilanadigal. Alvan Tirunattan, a temple servant, is stated to have received the gift and undertaken to maintain the lamp perpetually.

36. CHOLA COPPER-PLATE CHARTER, ESALAM, DISTRICT SOUTH ARCOT.—This copper-plate charter, originally from the village Esalam, and now preserved in the Directorate of Archaeology, Madras, is in Sanskrit and Tamil languages and Grantha and Tamil characters. Dated in he twenty-fourth year (AD 1035-36) of the reign of the Chola king Rajendrachola I, it gives the genealogy of the Chola dynasty. It also refers to the gilding of the Chidambaram temple by Aditya I with the gold brought from the Kongu country. It mentions the construction of the famous Brihadisvara temple atThanjavur by Rajaraja I and the temple at Gangaikondacholapuram by Rajendrachola I. It records that the taxes collected from the village Vikramacholanallur are to be assigned to the temple of Tiruviramesvaram-udaiyar at Rajaraja-chaturvedimangalam. The *prasasti* was composed by the poet Narayana, son of Sankara, a resident of Parsva-grama. The engraver was Ulagalandachola *alias* Vasudeva, son of Kari.

37. CHOLA INSCRIPTION, KIU\PPALUNUR, DISTRICT TIRUCHCHIRAPPALLI.—This inscription, in Tamil language and characters, is engraved on the north wall of the central shrine of the Tiruvalanduraiyar temple. Dated in the ninth year(AD 915-16) of the reign of the Chola king Parakesarivarman, it states that an official, Kavisiyan Nakkan Marapiran *alias* Nambiyaruran of Mangalam in Mangalanadu, on the orders of his chief Pal uvettaraiar Maravan Kandan, supervised the construction of theTiruvalandurai temple in stone at Sirupaluvur. It also records the gift of 20 sheep by Nakkan Marapiran for the curd and rice offerings to be^made during the three *sandhis* to the deity Tiruvalandurai Mahadeva.

UTTAR PRADESH

38. SALANKAYANA INSCRIPTION, ALLAHABAD, DISTRICT ALLAHABAD.—This inscription, originally from Kausambi, District Allahabad, and now preserved in the Municipal Museum, Allahabad, is engraved on a circular stone. The language is a mixture of Prakrit and Sanskrit. The script employed

for writing twice one and the same text in two lines is in pre-Gupta characters of the second century AD. It refers to the Kulaka of Bhutila, the *amatya* of Salankayana, his son Payevila(?) and his son's wife Samayika (See *J.E.S.I.,* Vol. XIV, pp. 95-98).

ARABIC AND PERSIAN INSCRIPTIONS[1]

ANDHRA PRADESH

1. PERSIAN EPITAPH, KAULAS, DISTRICT NEAMABAD.—A Persian record found from the bastion of the fort records the construction of *darwaza* of the bastion by Khasim Ghulam AH.

. BIHAR

2. INSCRIPTION OF THE SULTANS OF BENGAL, BAMAI, DISTRICT JAHANABAD.—This badly damaged epigraph of Nasiru'd-Dunya Wa'd-Din Abu'l-Muzaffar Nusrat Shah, records the construction of a mosque in AH 934 (AD 1527-28).

3. EPITAPHS, CHEWARA, DISTRICT MONGHYR.—Of the three epitaphs, the first refers to the death of a learned man named Taimu'llah in AH (AD 1815-16). It also records that the deceased was born in AH 1150 (AD 1737-38) and he was descended from His Holiness Imam Baqir and belonged to the educated Sayyid family of Tirrnidh. The deceased had acquired knowledge in the science of Islamic learning in the period of thirty years and got proficiency. He was favourite of the king of his time. He thereafter engaged himself in teaching the *Tafsir* (Commentary on the *Qur'an), Figh* (Jurisprudence) and *Hadith* (Traditions). His son ShujaV d-Din got the inscriptional slab prepared (inscribed) in AH 1236 corresponding to Fasli 1229 (AD 1821) at the capital city of Shahjahanabad (Delhi) where he was holding the post of *Sadarat.* It further states that his brother Muhammad Yahya son of Taimu'llah who was in the judiciary also died the same year (i.e. AD 1821) and was buried near the grave of his father.

The second epitaph records the demise of Shuja'u'd-Din ***Ali** Ridvi (son of Taimu'llah) in AH 1821-22. It also contains Persian verses which were perhaps composed by the deceased himself.

The third epitaph pertains to a lady who was a scion of the Mughal family of Delhi. The deceased, Nawwab Giti Ara Begam who died in AH 1256 (AD 1840-41) was the daughther of Nawwab Rib'atu'-Nisa Begam and grand-daughter of the Delhi emperor Shah 'Alam Badshah (AD 1759-88). She was born and brought up in the Red Fort (at Delhi). It further states that as she was married to Sayyid Shuja'u'd-Din 'Ali Khan Bahadur Ridvi, and was (after her death) buried here.

'Information from: N.M. Ganam, assisted by M.F. Khan, S.S. Hussain, M.Y.Quddusi, M.I. Quddusi and G.S. Kh waja, of the Epigraphy Branch of the Survey, Nagpur. Two hundred and thirty inscriptions were copied, examined and reported during the year under review out of which important on<*s are noticed here excepting item no. 1 from Department of Archaeology and Museums, Government of Andhra Pradesh.

4. MISCELLANEOUS INSCRIPTIONS, DISTRICT PATNA.—An inscription from Patna records that the tomb of Imam Humam was constructed by Karimu'llah in AH 1179 (AD 1765-66). The metrical text was composed by 'Ishqi. An epitaph from the same place records the death of Muhammadi Baig which occured in AH 1218 (AD 1803). Another epitaph from the same place also records the death of a lady named Bi 'Aziman in AH 1232 (AD 1817). An inscription from Phulwari Sharif, states that a mosque inside the Khanqah (Hospice) of Pir Mujib which *v/askaccha* built in AH 1131 (AD 1718-19) was rebuilt in masonry in AH 1239 (AD 1823-24). An inscription from Danapur, records the construction of a mosque in AH 1244 (AD 1828-29), by a lady named Saliha. An inscription in a *mudgar* (i.e. a club) from the Museum at Patna which is dated AH 1288 (AD 1871-72), contains the name of its owner as Nayakji Bahadur.

An epigraph from Patna, records that Gauhar Begam constructed the lofty edifice (i.e. a mosque on which it appears) in AH 1289 (AD 1872-73). Its metrical text was composed by Nikhat. Another inscription from the same place, written by Muhammad 'AH Khan, records the construction of a mosque in AH 1290 (AD 1873-74). Yet another inscription from Patna, refers to the renovation of a ruined mosque in AH 1291 (AD 1874) by Sayyid Lutf 'Ali. Its metrical text was composed by Furqati.

GUJARAT

5. INSCRIPTION, AHMEDABAD, DISTRICT AHMEDABAD.—This inscription states that at the tomb of Shaikh Alahbad, the construction of a mosque which was commenced by the deceased Ghazi Muhammad was completed through the efforts of his younger brother Jan Muhammad in AH 1063 (AD 1652-53). The chronogram was composed by Hadi.

6. INSCRIPTION OF FIRUZ SHAH TUGHLUQ, KHAMBHAT (CAMBAY), DISTRICT KHEDA.—This inscription of Sultan Firuz Shah of the Tughluq dynasty, dated the 1st of Dhi'l Qa'da, AH 762 (AD 1361) is in Persian prose (pi. XLIX A). It records the successful expedition to Jajnagar (Orissa) accomplished by Sultan Firuz Shah.

The inscription also furnishes other interesting information *viz.,* on the hunting of wild elephants by the Sultan and their capture, on the character of the Rai of Jajnagar, his flight with his few persons on the approach of the royal army and offering his submission thereafter. It also mentions Jagannath temple and about some of the images which were carried away to Delhi.

The record mentions that the Sultan had first marched against Lakhnauti (i.e. Gaur) in AH 759 (AD 1358) and on his return from there, had halted at Junapur (i.e. the present Jaunpur) which he had founded in the name of Muhammad bin Tughluq (his real name was Fakhru'd-Din Juna). From Jaunpur, the Sultan set out for Jajnagar on the 20th of Dhi'l Qa'da, AH 761 (2nd October, AD 1360). The inscription further mentions that no other Muslim Sultan had accomplished such a task and captured such a large number of wild elephants.

This inscription also mentions in the concluding lines, Maliku'sh-Sharq Malik Na'ib-i-Barbak Ibrahim Sultani who may have set up this inscriptional slab in commemoration at this important port town of Cambay.

KARNATAKA

7. INSCRIPTION OF 'ADIL SHAMS OF BIJAPUR, ATHNI, DISTRICT BELGAUM.—This epigraph of Muhammad 'Adil Shah, records the construction of an edifice (i.e. a step-well on which it appears) under the supervision of Lanku (?) (son of) Pusu, the Sar Hawaladar in AH 1059 (AD 1649) during the *muqasa-ship* of Ikhlas Khan II.

8. INSCRIPTION, KIIAROSHI, DISTRICT BELGAUM.—This inscription states that the 'Idgah was com pleted in AH 1272 (AD 1855) by Muhammad son of late Maichdum Patel, an inhabitant of Karvish (the find spot of the inscription).

9. INSCRIPTION OF THE 'ADIL SHAHIS OF BIJAPUR, TORGAL, DISTRICT BELGAUM.—Of the two inscrip tions, one belongs to the reign of Ibrahim 'Adil Shah I. It records the completion evidently of bastion (on which it appears) in *Shuhur* Sana 935 (AH 941/AD 1535) by Isma'il son of 'Abdu'1-Aziz *Khurd Sala* (of younger age i.e. junior). The other badly damaged inscription of Ibrahim Adil Shah II, records the construction of a bastion called '*Burj-i-Husaini'* in *Shuhur* sana 984 corresponding to AH 991 (AD 1583) by Khan-i-Azam Ibrahim Khan.

MADHYA PRADESH

10. INSCRIPTION OF THE SURS, SHEOPUR, DISTRICT MORENA.—This interesting record of Islam Shah states that Masnad-i-Ali Mansur Khan, obtained martyrdom in the battle fought, against the Khichis at Gogur in AH 960 (AD 1553). It also records that his tomb was constructed in AH 961 (AD 1553-54) at the instance of Pir 'AH (son of) Mirak Sur. It also mentions Parsu or Barsu as master artist *(Mahir).*

11. MUGHAL INSCRIPTION, SHEOPUR, DISTRICT MORENA.—This inscription of Jahangir is badly damaged and crudely executed. It forms the text of a royal order advising the *Hakims* (governors), the *Mutasaddis* (administrators) and the *Pargana* Sheopur that certain taxes were remitted and that they should not harass the people on account of this.

12. MISCELLANEOUS INSCRIPTION, DISTRICT SHIVPURI.—An epitaph from Narwar, records the death in AH 1188 (AD 1774-75) of Muhammad Sharif who is mentioned as the physician of the aged. A damaged record on a gun, states that the cannon named *Top-i-Jawahar,* belonging to the government of Bakhshiu'l-Mamalik, Nawwab Najibu'd-Daula Dabita Khan who manfactured it under the super vision of Rao Rawan (chief of the chiefs) Qutabu'd-Din. The names of the two gunners mentioned in the text are Mir' Abdu'1-Baqi and Fadl-'Ali. As the inscription is damaged, the date of its manufacture is lost but palaeographically the record balongs to the eighteenth century.

13.MUGHAL INSCRIPTIONS, DISTRICT SHIVPURI.—A badly damaged record of Akbar was found at Kolaras. It mentions Tahawwur Khan, the governor of the *Sarkar* of the fort of Narwar. Its purport

is not clear. Another epigraph of Shahjahan from Ranod, records the construction of mosque, a well and market by Ni'mat Khan in AH 1066 (AD 1655-56).

Four inscription of Aurangzeb have been found in the district. Out of four epigrapphs of Aurangzeb from Ranod, one states the construction of a mosque for the sake of 'Allah in AH 1085 (AD 1674) by Dadan (?) son of Da'ud, son of Hasan, the weaver (Nurbaf). Another record, from the same place, mentions that Shaikh Pir Shah and Shaikh Muzaffar, sons of Shaikh 'AH, built an edifice (i.e. a mosque on which it appears) in AH 1088 (AD 1677). An epigraph from the same place dated in the forty-first regnal year of Aurangzeb corresponding AH 1108 (AD 1697), records the construction of mosque by Jahangir, the cow butcher. Another record from Narwar, states that a mosque was constructed by His Holiness Shah Ma'ruf Kulabi in AH 1088 (AD 1678). It also mentions Ibrahim as the scribe and Lachhu as the stonecutter.

Of the two records of the later Mughal emperors from Ranod, the one recording the construction of mosque by Pir Khan was earlier noticed *(ARE.,* 1961-62, Appendix D, No. 78). On re-examination, it was found to contain the date in chronogram as AH 1155 (AD 1742) in twenty-fourth regnal year evidently of Muhammad Shah and not of Shah ' Alam II. Another record, states that a *Chabutara* was constructed during the *sijjadeship* of Shah Matin in the third regnal year of Ahmad Shan, corresponding to AH 1163 (AD 1750). Its text was composed by Sayyid Ahmad. It also mentions Prithi as the stone-cutter.

14. INSCRIPTION OF THE SURS, DAULATABAD, DISTRICT SHIVPURI.—This historically important inscription of Islam Shah Sur states that Daulat Khan had constructed a mosque in the valley on the bank of river Sind (Kali Sind) in AH 957 (AD 1550-51); its text was composed and inscribed by Naziri Shattari.

MAHARASHTRA

15. EPIGRAPHS, MANORUI. PIR, DISTRICT A KOLA.—Two epigraphs of identical purport record the construction of the new enclosure (of the Dargah of the saint Shah Amanu'llah) and a pleasing garden in AH 1306 (AD 1888-89), by 'Ainu'd-Din, the *sajjada.* The builder is mentioned in the text as the great grandson of Shah Aman disciple of Shah Amanu'llah. Its metrical text was composed by 'Abdu's-Samad.

16. MUGHAL INSCRIPTION, ACHALPUR, DISTRICT AMRAVATI.—An epigraph of Shah 'Alam II on the Dula gate, states that a gate called the Rahman gate was constructed by the grace of Shah Rahman Ghazi of exalted dignity, in AH 1180 (AD 1766-67).

17. MISCELLANEOUS INSCRIPTIONS, DISTRICT BULDHANA.—Of the two inscriptions, one from Rasulpur records the construction of a mosque in AH 1057 (AD 1647-48) by one Malik Hasan. The other one from Malkapur, Raja Nanrvant of exalted dignity, constructed a well and a wonderful garden in AH 1204 (AD 1798-90).

RAJASTHAN

18. INSCRIPTIONS, DISTRICT BUNDI.—Of the two inscriptions, one from Nainwa, states that the auspicious tomb of Miran Sayyid Salar with a four-walled enclosure was completed in AH 1058 corresponding to VS 1705 (AD 1648), by Muhammad Shah, son of Piru, *rangrez, nilagar* (dyer and indigo colour-maker) when Raja Sri Nahar Khan Solanki was the Jagirdar. The second one, dated AH 1094 (AD 1682-83) from Bundi, refers to the construction of a mosque. The name of the builder is not specified.

19. INSCRIPTION OF THE SULTANS OF MALWA, NAINWA, DISTRICT BUNDI.—Dated AH 870 (AD 1465), the epigraph records that when (Prince) 'Alau'd-Din was in (charge of) Ranthambhor, Nainwa was conquered and a mosque in place of a temple was constructed inside the fort by Shaikh 'Abdu'llah, the *Shahna* of the *pargana* Nainwa.

20. INSCRIPTION, KHATOLI, DISTRICT KOTA.—This epigraph states that Jama'iyat, son of Bhikan Khan, an inhabitant of Jhalatala, situated in the Bhusawar, district of Bharatpur was a *jagirdar* in the time of Maharao Raja Ram Singhji, the chief of Bundi and held the rank of one thousand five hundred and thirty. He was a man of position possessing the elephant and the palanquin; he also received honour and respect from the rulers of Jaipur and Jodhpur. It further states that he had come to this place (i.e. Khatoli) to pay his respect to Maharaja Bhairon Singhji and according to the Divine decree, he expired here in VS 1914 corresponding to AH 1274 (AD 1857-58).

21 MUGHAL INSCRIPTION, NAHARGARH, DISTRICT KOTA.—This epigraph of Aurangzeb states that a fort was constructed in AH 1090 (AD 1679) by Qutbu'd-Din, son of Nahar Dil, Rajput of the Rathod clan and named this fort and the place as Nahargarh.

22. INSCRIPTIONS, DISTRICT SAWAI MADHOPUR.—Of the two inscriptions, the first from Sherpur records the construction of a mosque in AH 1100 (AD 1688-89) by Nizamu'd-Din 'Ali. The second record from Khandar mentions the name Muhammad Husain Khan, *thanadar* of Khandar and a native of (name not legible) in the district of Mazaffar Nagar and Munshi Muhammad Isma'il, the *muharrir* (clerk) of the *thana.* It also contains the date AH 1290 (AD 1873-74) which is probably that of the construction of an 'Idgah on which it appears.

23. INSCRIPTIONS, CHHAN, DISTRICT SAWAI MADHOPUR.—Fragments of inscriptions containing religious texts assignable on palaeographical grounds to not later than thirteenth century and remark able for their florid *Naskh* style of calligraphy were found at Chhan, the medieval Jhain near Ranthambhor.

24. INSCRIFIION OF THE LODIS, KHANDAR, DISTRICT SAWAI MADHOPUR.—Belonging to the reign of Ibrahim Lodi and dated AH 928 (AD 1522), this historically important inscription states that a mosque was constructed by Masnad-i-'Ali Zafar Khan at the instance and under the supervision of

his son Shaikh Hasan. Zafar Khan is described in the text as the conquerer of Khandar fort. The text which is in Persian verse and prose was composed by Ahmad 'Isa and inscribed by 'Abdu's-Sattar, son of 'Abdu'1-Haq, the *Khatib* (i.e., preacher). It also mentions Ahmad Gada'i (?) as the *Shahna* (Superintendent).

25. MISCELLANEOUS INSCRIPTIONS, TODA BHIM, DISTRICT SAWAI MADHOPUR.—Of the two inscrip tions, the first on a tomb containing religious verses, is dated AH 980 (AD 1572). The second inscription is one more record of Mir Muhammad Ma'sum Nami, celebrated nobleman and litterateur of Akbar's court. The epigraph also states that he had reached this place in AH 1013 (AD 1604-05) on his return from the ambassadorial assignment to Iraq (i.e. Iran).

26. EPITAPH, TONK, DISTRICT TONK.—This known epitaph, dated AH 791 (AD 1389), originally from Hindaun, was noticed earlier *(ARE,* 1955-56, No. D, p. 168). On its re-examination, it was found to contain the name of the husband of the deceased lady (name not given) as Sarkhail Turmati, and not Bir Khan Turmati. Also the day of the month of Sha'ban is mentioned as twentieth and not sixth.

27. INCRIPTIONS OF THE MAMI.UKS, TONK, DISTRICT TONK.—This is a damaged but an important record reported to have been brought from Nagaur. This damaged record belongs to the reign of (Nasiru'd-Din) Mahmud Shah son of Sultan Nasir Amiru'l-Mu'minin (title of Sultan Iltutmish). It is dated AH 655 (AD 1257) and records the construction of a mosque by Aibak a's-Sanai (?) during the governorship of Amir Siphasalar (name lost but the person is very likely Balban who had his *iqta** of Nagaur during this time).

TAMIL NADU

28. INSCRIPTIONS, DISTRICT DHARMAPURI.—Of the two inscriptions, the first one in Persian verse from Krishnagiri, records the construction of a lofty mosque by Babu, son of 'Abdu'r-Razzaq Khan, the *Hawaladar* in AH 1149 (AD 1736-37). The second, which is an epitaph in Urdu from Rayakottai, records the death in AH 1269 (AD 1852) of Shaikh Adam.

29. EPIGRAPH, SALEM, DISTRICT SALEM.—This epigraph records the construction of a mosque called Masjid-i-'Ali in AH 1178 (AD 1764-65). Its metrical text was composed by Sabzwari.

UTTAR PRADESH

30. INSCRIPTION, MAI.LAWAN, DISTRICT HARDOI.—This epigraph states that Muhammad Bakhsh by spending his own amount, constructed a mosque in AH 1238 (AD 1822-23).

31. MISCELLANEOUS INSCRIFI IONS, DISTRICT UNNAO.—Of the three inscriptions from Safipur, the first states that this edifice (i.e. a porched entrance) in front of the tomb of Makhdum Shah Safi was

constructed by Muhammad 'Ali in AH 1147 (AD 1734-35). The second inscription, dated AH 1195 (AD 1780-81), records the construction of a mosque by Shah Fahmu'llah, the spiritual guide of Maulavi Fadl-i-Azirh.The third record which is dated AH 1249 (AD 1833-34), states that Haji Barkat laid the foundation of a mosque with sincerity of heart. Its text was composed by Aslam. Another inscription from Bangarmau, records the construction of a mosque by Imam Bakhsh in AH 1255 (AD 1839-40). According to an inscription from Nawabganj, a *Sara,* a market *(ganj),* a mosque, a wall and a garden were constructed by Nawwab Aminu'd-Daula (Imaded Husain Khan 'Umdatu'1-Mulk) in AH 1260 (AD 1844-45).

32. INSCRIPTIONS OF THE NAWWABS OF AWADH, DISTRICT UNNAO.—An epigraph from Safipur, states that a mosque was constructed at Safipur in AH 1202 (AD 1787-88) in the reign of Asaf (i.e. Asafu'd-Daula) by 'Azim Khan. According to another inscription from Asiwan, a beautiful mosque was constructed in the time of Abu'l-Muzaffar Shah-i-zaman Mu'izu'd Din (i.e. Ghaziu'd-Dih Haidar) by Ghulam 'Ali Khan, man of virtues, in AH 1237 (AD 1821-22).

WEST BENGAL

33. INSCRIPTIONS OF THE SULTANS OF BENGAL, DISTRICT MALDA.—Eight inscriptions of the Bengal Sultans were brought to light. An epigraph from'Mahdipur, records the construction of a mosque by Nasiru'd-Dunya-wa'd-Din Abu'l-Muzaffar Mahmud Shah I, in AH 863 (AD 1458-59). Another damaged fragmentary inscription of the same king, from the same place records some construction.

An outstanding find among the new inscriptions of Bengal Sultans is the records of Sultan Barbak Shah found on a mosque at Mahdipur. This epigraph, is largely identical in purport and executed almost in the same calligraphical style as that of the famous inscription of this Sultan, now exhibited in the University Museum of Philadelphia in U.S.A. and which is known as one of the best •calligraphical specimens of the inscriptions of the Bengal Sultans. This is unfortunately fragmentary and consists of only the lower line of its two-lines inscription and is divided into sixteen vertical compartments. The epigraph, in Arabic verse and Persian prose, states that during the reign of the Shah, the asylum of the world, Ruknu'd-Dunya wa'd-Din Abu'l-Muzaffar Sultan Barbak Shah, a magnificent gate called the Middle gate *(Miyana Dar)* for the judiciary and treasury was constructed in AH 871 (AD 1466-67).

There is yet another fragmentary epigraph from Mahdipur recording some consruction. The name of the reigning king is lost. Only the last letter 'Kaf of the king's name with the word 'Shah' followed by the phrase meaning 'May Allah perpetuate his kingdom and sovereignty' are extant. If the letter 'Kaf is taken as the final letter of the work Barbak, in that case the reigning king is Barbak Shah.

An inscription, now in the B.T. college of Malda town but reported to have been brought from Pichli Gangarampur, belongs to the reign of Shamsu'd-Dunya wa'd-Din Abu'l-Mazaffar Yusuf Shah, son of Barbak Shah a's-Sultan, son of Mahmud Shah a's-Sultan and is dated AH 881 (AD 1476). The important aspect of this beautiful inscription is that the record was inscribed by Kada (or Gada)

Badshah who also composed Persian verses of the text. Unfortunately, as the slab is fragmentary, its exact purport cannot be made oui, though it is quite likely that the record was meant for some building only.

At Mahdipur again was found a record which belongs to another Bengal Sultan Fath Shah who ruled from AD 1481 to 1486. The epigraph is fragmentary and consequently is undated. The extant text executed in beautiful *Naskh,* contains five verses in Persian in praise of the king.

A new inscription (pi. XLIX B) found at Shujapur, belongs o the reign of Sultan 'Alau'-Din Husain Shah. This record in Arabic, dated AH 922 (AD 1516-17) and remarkable for its well executed calligraphy in *Tughra,* records the construction of a Jami[1] mosque by Ni'mat Khan.

A new inscription of Sultan Nasiru'd-Dunya wa'd-Din Abu'l-Muzaffar Nusrat Shah, now in Malda Museum, is reported to have been brought from Gaur in recent times. The inscription which is also remarkable for its beautiful *Naskh* in *Tughra,* records the construction of a gateway of the Jami' mosque in AH 930 (AD 1523-24).

III. NUMISMATICS AND TREASURE TROVE'

ANDHRA PRADESH

1. MISCELLANEOUS OBJECTS. STATE MUSEUM, HYDERABAD.—A treasure-trove comprising gold ornaments and coins of gold, silver, copper and potin was received by the State Museum from various districts of the State. These coins belong to Satavahanas, Sultans of Delhi, Bahmanis, Kakatiyas, Mughals, Vijayanagar, Asaf Jahi, British and Indian Native States.

GUJARAT

2. METAL IMAGES AND DHUPIYA, SHIYAWADA, DISTRICT AHMEDABAD.—A hoard of Jaina metal images and one Dhupiya was recovered as treasure-trove during the course of digging under draught relief work at Shiyawada (Taluk Sanad). Some of the images are inscribed.

3. SULTANATE COINS, CHHARA, DISTRICT AMRELI.—Three hundred and ten coins alloyed with silver and five gold coins were found as treasure-trove from Kodinar taluk. These coins include the issues of Muhammad Tughluq, Alau'd-din Khalji and Firuz Tughluq dated from AD 1296 to AD 1316.

4. STONE SCULPTURES, JUNA SOJA, DISTRICT BANASKANTHA.—During the course of digging in the field, stone sculptures were found as treasure trove.

5. ARCHITECTURAL REMAINS AND SCULPTURES, BHUTIYA VASANA, DISTRICT MAIIESANA.—Architec tural remains and images of god and goddess, *apsaras,* in sandstone and white marble, were found during the course of digging of a well from Patan taluk which range in date from *circa* tenth century to thirteenth century AD.

6. KSHATRAPA COINS, KANPAR, DISTRICT RAJKOT.—A hoard of copper and other base metal coins of the Kshatrapa period was found as treasure trove from Jasdan taluk.

7. STONE SCULPTURES, HIMATNAGAR, DISTRICT SABARAKANTHA.—Stone Jaina sculptures were col lected as treasure trove from District Sabarkantha.

KARNATAKA

8. SILVER COINS, NANDABAVI IN ATHANI TALUK, DISTRICT BELGAUM.—Sixty-two silver and rupee coins issued by George V and George VI were collected.

'Information from : 1, Directorate of Archaeology and Museums, Andhra Pradesh; 2-7, Director of Archaeology, Gujarat; 8-13, Director of Archaeology and Museums, Karnataka; 15, Commissioner, Gwalior Division, INTACH; 14-20, Director, Archaeology and Museums. Bhc/al, Madhya Pradesh; 21-26, Director of Archaeology and Museums, Rajasthan; and 27, Director, Government Museum, Madras.

9. GOLD AND COPPER COINS, SOVENAHALLI, DISTRICT BELLARY.—Nineteen coins belonging to the reign of Krishnadevaraya, Achyutaraya, Sripratapachyutraya, Tirumalaraya and Sadasivaraya of Vijayanagara were collected from Taluk Sandur. Two coins are without any figure or legend. Ol the three copper coins, one each belongs to Krishnaraja Wadiyar of Mysore, king George V and the East India Company.

10. SILVER AND COPPER COINS, MATTAVARA, DISTRICT CHIKKAMAGALUR.—Sixty-three coins issued by Queen Victoria and Emperor Edward VII were reported.

11. GOLD COINS, KIRUMANI, DISTRICT KOLAR.—The Department of Archaeology and Museums, Karnataka, acquired fifty-one gold coins called the 'Kanthiraya Phanams' as treasure trove.

12. SILVER COINS, RAMACHANDRAPURA, DISTRICT KOLAR.—A treasure-trove of nine hundred and eighty-nine silver coins of the British period was acquired by the Department of Archaeology and Museums, Karnataka.

13. GOLD COINS, HULIDEVARABANA, DISTRICT SHIMOGA.—A treasure-trove of four Vijayanagara gold coins, three silver pieces and one gold piece was discovered.

MADHYA PRADESH

14. SILVER COINS, DISTRICT CHHINDWARA.—Twenty-nine silver circular coins, locket and bangles were found at Chhindwara. The hoard includes twenty-two coins of Ahmad Shah and seven coins of the Queen Victoria.

15. COPPER COINS, CHEEMA, DISTRICT DATIA.—A hoard of one thousand and eighty-two copper coins of the Naga rulers was discovered.

16. COPPER AND SILVER COINS, DISTRICT DHAR.—Seventy-two copper and gilded coins were found from District Dhar. The hoard includes copper coins of Shivaji Rao Holkar, Madhav Rao Scindia, Jivaji Rao Scindia, East India Company and the British monarchs. A hoard of nine silver circular coins was also found from the same district of which two coins of Aurangzeb, one of Azam Shah, two of Farukhsiyar and four coins of Muhammad Shah.

17. SILVER COINS, DISTRICT INDORE.—One hundred and ninety-one silver circular coins of Queen Victoria were found.

18. SILVER COINS, DISTRICT JABALPUR.—Of the sixty silver circular coins found from Jabalpur district fifty-eight coins bear the name of the Kalachuri ruler Gangeyadeva and two of Chandela ruler Madana Varma.

19. COPPER COINS, DISTRICT KHARGAON.—Thirty-eight circular copper coins of Ahilya Bai Holkar were found.

20. SILVF.R COINS, DISTRICT VIDISIIA.—Seventy-three silver circular coins of Mughal ruler Shah Alain II was reported.

RAJASTHAN

21. SILVER COINS, PATODI, DISTRICT BARMER.—The Government Museum, Jodhpur, acquired treasure-trove of fifteen silver coins of the State period from village Patodi.

22. SILVF.R COINS, SAMADARI, DISTRICT BARMER.—A hoard of two-hundred and ninety-nine silver coins were found from village Samadari as treasure trove.

23. MISCI-LLANEOUS COINS, VIRATNAGAR, DISTRICT JAIPUR.—Eight copper coins of the State period from Viratnagar were brought to light.

24. SILVER COINS, KADIHEDA, DISTRICT KOTA.—The Government Museum, Kota, acquired a treasure-trove of seventy-four silver coins of the British period.

25. COPPER COINS, KURADJIAN, DISTRICT SIKAR.—One late Kushana copper coin was acquired by the Depanment of Archaeology and Museums, Rajasthan, from village Kuradhan.

26. MUGHAL COINS, GOVERNMENT MUSEUM, UDAEPUR.—Fourteen silver coins of Akbar were handed over to the Government Museum, by the Hindustan Zinc Limited, Udaipur.

TAMIL NADU

27. MISCI-LLANI-OUS OBJECTS, GOVERNMENT MUSEUM, MADRAS.—The Museum acquired various items as treasure trove from different places in Tamil Nadu. These include temple umbrellas of metal, copper vessels, bells, smaller vessels and bronze images of Somaskanda, Chandrasekhara, Ganesa, Thirugnanasambandha, Ambal.Tripurantaka, Parvati, etc., and stone sculptures of Vishnu, Sridevi and Bhudevi. Two wooden boxes with ancient carvings, two bronze images and ten palm leaf manuscripts in Tamil and Telugu script were received as gifts to the museum. Nine hundred and thiny-three south Indian Phanams (inferior gold) received as a treasure trove items from various parts of the State were also added to the collection.

IV. OTHER IMPORTANT DISCOVERIES

ANDHRA PRADESH

1. INSCRIPTIONS, LEPAKSHI, DISTRICT ANANTAPUR.—A.P. Sagar of the Hyderabad Circle of the Survey noticed fragments of early Telugu inscriptions on a masonry stone while dismantling barri cade wall of a small shrine.

2. TEMPLE, HAMMALAMADUGU MANDAL, DISTRICT CUDDAPAH.—The Department of Archaeology and Museums, Government of Andhra Pradesh, noticed a Siva temple assignable to eleventh century on the banks of the river Pennar near Pathasugamanchipalli.

3. TELUGU INSCRIPTION, KETAVARAM, DISTRICT GUNTUR.—D. Hanumantha Rao of the Hyderabad Circle of the Survey noticed an inscription of Vijayanagara period fixed at the old ferry point at Ketavaram, 5 km south-west of Chetyala Village.

4. INSCRIPTIONS, KOLLUR, DISTRICT GUNTUR.—D. Hanumantha Rao of the Hyderabad Circle of the Survey noticed six inscriptions. Of these one is irr Brahmi characters of fifth-sixth century engraved on entrance steps of the enclosure wall of the Ramesvara temple complex while the other four are in Telugu characters of twelfth-seventeenth century inscribed on a slate rock in front of the temple. The fifth is in Arabic characters engraved on the plaster of the interior walls in the Qutb Shahi mosque.

5. ANCIENT SITES, TEMPLES, SCULPTURES AND INSCRIPTIONS, DISTRICT MAHBUBNAGAR.—The Depart ment of Archaeology and Museums, Government of Andhra Pradesh, surveyed the submergence area falling under the scheme of construction of a reservoir on the Peddavagu near Sangambanda in Maktal taluk and located Middle Palaeolithic, Neolithic and early historical sites; temple dedicated to Ramalingesvara, assignable to twelfth century; loose sculptures of Vinayaka, Siva and Jaina *tirthankara* ; and architectural members and inscriptions belonging to the Chalukyas of Kalyana.

6. ROCK BRUISINGS AND NEOLITHIC SITE, DISTRICT VIJAYAWADA.—The Department of Archaeology and Museums, Government of Andhra Pradesh, located rock-bruising of protohistoric period at Magalarajapuram hill in Vijayawada town and a neolithic site was also located.

7. ARCHITECTURAL REMAINS, SCULPTURES AND INSCRIPTIONS, DISTRICT WEST GODAVARI.—The Depart ment of Arachaeology and Museums, Government of Andhra Pradesh, found in the village of Peddi Gonapavaram in Jeelugumilli mandala architectural remains, inscribed pillars and sculptures belong ing to thirteenth-fourteenth century AD.

GUJARAT

8. SCULPTURES, DANTA, DISTRICT BANASKANTHA.—The Department of Archaeology, Government of Gujarat, inspected and identified a hoard of sculptures confiscated by Javadkhan Sindhi, PSI of Danta from different sites. The image of Ganesa in schist datable to seventh century and white marble *apsara,* assignable to twelfth century deserve special mention.

9. BRAIIMI INSCRIPTION, POMALPADA, DISTRICT BIIARUCH.—Vilas Jadav of the Vadodara Circle of the Survey discovered fragmentary stone inscription.

10. MONOLITHIC FIGURE, CHADVA, DISTRICT JUNAGADH.—The Western Circle of the Department of Archaeology, Government of Gujarat, located a huge monolithic figure of elephant assignable to twelfth century.

11. INSCRIPTION, KHAMBHAT, DISTRICT KHEDA.—The Department of Archaeology, Government of Gujarat found a Persian inscription dated to AD 1360 from Khambhat town now preserved in the PWD office.

12. SCULPTURES, PATAN, DISTRICT MAHESANA.—In the course of desilting work of Rani-ki-Vav, Vadodara Circle of the Survey collected two sculptures, one of *tirthankara* in bronze (16 x 10 cm) and the other (42 x 28 x 6 cm) of Rani Udayamati (pi. L A) in white marble. Besides, a fragmentary inscription in Sanskrit language (pi. LB) was found from Patan.

13. LOOSE SCULPTURES, PILUWADA, DISTRICT MAHESANA.—In the course of village-to-village survey, Department of Archaeology. Government of Gujarat, discovered some loose sculptures. Notable among them are the image of Surya and Mahishamardini assignable to twelfth century AD.

14. SCULPTURES, DISTRICT VADODARA.—In the course of village-to-village survey scheme in the taluk of Dabhoi, the Department of Archaeology, Government of Gujarat, discovered two images of Siva dated to eleventh century at Naranpura and Vadaj.

15. SCULPTURAL AND ARCHITECTURAL REMAINS, TAJPURA, DISTRICT VADODARA.—S. Ananda Sastry, S.V.P. Halakatti and Vilas Jadhav of the Vadodara Circle of the Survey located loose sculptural and architectural remains of medieval period, near Tajpura village.

HIMACHAL PRADESH

16. SCULPTURAL AND ARCHITECTURAL REMAINS AND POTTERY, AMBOA, DISTRICT SIRMOUR.—The Department of Language and Culture, Government of Himachal Pradesh, discovered number of loose architectural and sculptural remains of a temple and potsherds from a mound near the village.

17. FRAGMENTARY SCULPTURES AND ARCHITECTURAL PIECES, BYAS, DISTRICT SIRMOUR.—In the course of preliminary survey of the District, the Department of Language and Culture, Government of Himachal Pradesh, located a large number of fragmentary sculptures and architectural pieces at the site.

18. ANTIQUARIAN REMAINS, MIRPUR KOTLA, DISTRICT SIRMOUR.—The Department of Language and Culture, Government of Himachal Pradesh, located a ancient mound and collected potsherds, stone sculptures, ruined walls, etc. at Mirpur Kotla.

19. SCULPTURES AND TEMPLE, PURUWALA, AMBIWALA, DISTRICT SIRMOUR.—The Department of Language and Culture, Government of Himachal Pradesh, noticed an ancient temple dedicated to goddess Kali and few sculptures from the site.

20. REMAINS OF STRUCTURES AND POTSHERDS, SADAR, DISTRICT SIRMOUR.—Remains of dressed stone structures and potsherds were found by the Department of Language and Culture, Government of Himachal Pradesh.

21. TEMPLE REMAINS AND STONE SCULPTURES, SIRMORITAL, DISTRICT SIRMOUR.—Remains of temple assignable to ninth century and pieces of stone sculptures were located by the Department of Language and Culture, Government of Himachal Pradesh.

JAMMU AND KASHMIR

22. TERRACOTTA SEALINGS, COPPER COIN AND SCULPTURES, PARIHASPORA, DISTRICT BARAMULLA.—In the course of laying out garden around the ancient remains, R.K. Sapru of the Horticulture Branch of the Survey encountered two terracotta sealings (11 x 5-5 cm and 11 x 4-7 cm) with stamped impression of stupa in low relief on both the sides and a circular copper coin, both datable to eighth century AD. The coin has a mutilated figure of king dressed and seated in *ardhaparyankasana* on the obverse and standing human figure with royal garments holding unidentified object in left hand on the reverse.

Besides, the Srinagar Circle of the Survey also salvaged from the debris twenty-eight sculptural pieces. On stylistic ground these sculptural pieces can be dated to eighth century AD.

23. EARLY MEDIEVAL TEMPLE, CHHATRAL, DISTRICT PUNCH.—R.C. Aggarwal, S.N. Jaiswal, S.N. Kesarwani and Puran Singh of the Srinagar Circle of the Survey located remains of an early medieval temple. On plan it consists of a *garbhagriha* and *mukha-mandapa* and it also contains trefoiled niche forpar.vva-deities.

24. EARLY MEDIEVAL SCULPTURES, BADAMIBAGH, DISTRICT SRINAGAR.—In the course of exploration in Badamibagh area, S.N. Kesarwani, L.P. Thapliyal, R.N. Kaw and S.N. Kanna of the Srinagar Circle

of the Survey noticed a group of seven rare Brahmanical and Buddhist sculptures (pi. LI) and two *Siva-lingas* near the Pandrethan temple. Noteworthy among them are a Vaishnavite male deity, Siva, Lokesvara, Buddha and lower part of a colossal image of Buddha. These images are datable to sixth-seventh century AD.

25. STONE SCULPTURES AND COPPER COINS, NARANAG, DISTRICT SRINAGAR.—In the course of conser vation work, Srinagar Circle of the Survey discovered seven stone sculptures and three copper coins. Notable among the sculptures are a torso of Vaikuntha Vishnu (52-2 x 21 x 10-5 cm), assignable to eighth-ninth century AD; badly damaged bust of Siva (28 x 5 x 1 cm) datable to eighth-ninth century AD; head of Bhairava (27 x 22 x 12 cm) datable to eighth-ninth century AD; Ganesa (12 x 10 x 5 cm) of tenth century AD; defaced figure of Ardhanarisvara (46 x 37 x 18 cm) datable to ninth century AD; and bust of Vaikuntha Vishnu (30 x 21 x 11 cm), all in stone.

26. EARLY MEDIEVAL TEMPLE, THIUN (HARI THUNE), DISTRICT SRINAGAR.—S.N. Kesarwani, S.N. Kanna and Bharat Bhushan Kaul of the Srinagar Circle of the Survey located remains of a temple which has a *iri-raiha garbhagriha* and *mukha-mandapa* on plan. On stylistic ground it can be dated to eighth century AD.

MADHYA PRADESH

27. ANCIENT TEMPLE, CHHOTADANGAR, DISTRICT BASTAR.—R.R. Singh and N.K. Pathak of the Department of Archaeology and Museums, Government of Madhya Pradesh, unearthed remains of temple and sculptures of Kakatiya period.

28. MEDIEVAL SCULPTURES, JAGADALPUR, DISTRICT BASTAR.—B.L. Nagarch of the Temple Survey Project, Northern Region of the Survey noticed an *ashtadfiatu* image of eight armed Mahishamardini, locally known as Manikyesvari Devi and two stone images of standing Bhairava and dancing Siva in the Mavali Devi temple in Rajawada Chowk at Jagadalpur. Besides, he also noticed stone images of standing Bhairava, Siva-Parvati seated on bull, standing Surya and Ganesa, fragmentary Navagraha panel, seated Bhairavi, kept in the Collectorate office, Jagadalpur.

29. COPPER CELT, DISTRICT BHIND.—R.P. Choudhury of the Department of Archaeology and Museums, Government of Madhya Pradesh, collected a copper celt belonging to Chalcolithic period.

30. ANCIENT SCULPTURES, TALAGAON, DISTRICT BILASPUR.—Plan of an early medieval temple on a raised *jagati* having sanctum, pillared *mandapa* was unearthed by G.L. Raikwar, Rahul Kumar Singh, A.P. Singh and C.L. Gupta under the supervision of K.K. Chakravarty and V.K. Bajpai of the Department of Archaeology and Museums, Government of Madhya Pradesh, at the temple-complex of Jethani and Deorani. An unique life-size stone sculpture identified as that of Rudra Pasupati (pi. LII A) was also found alongwith some other sculptures of Sakta p'antheon, which are in terms of style and features are post-Gupta.

31. MEDIEVAL TEMPLES, DISTRICT DIIAR.—B.L. Nagarch of the Temple Survey Project, Northern Region of the Survey located the ruins of a medieval Brahmanical temple at Vasavi. Noteworthy among them are an image of standing Ganesa and a ceiling stone slab carved with a full-blown lotus.

R.S. Garg of the Department of Archaeology and Museums, Government of Madhya Pradesh, also discovered a rock-cut temple at the above referred site.

32. TEMPLES AND SCULPTURES, BUDHI MANDU, DISTRICT DHAR.—R.S. Garg of the Department of Archaeology and Museums, Government of Madhya Pradesh reported the discovery[1] of plans of Pratihara and Paramara temples and Brahmanical sculptures from Budhi Mandu.

33. STEP-WELL, CULNA, DISTRICT DIIAR.—Joseph of the Bhopal Circle of the Survey noticed a step well belonging to the Paramara period.

34. MEDIEVAL SCULPTURES, DIIARAMPURI, DISTRICT DIIAR.—A colossal image of a bearded sage or king locally known as Chintamani Deva standing in *anjalimudra* has been discovered from Jina-Mohalla at Dharampuri by B.L. Nagarch of the Temple Survey Project, Northern Region of the Survey. The image is flanked on either side by standing female attendant and a dagger is tied to his belt.

35. STONE AGE SITES, CHANDERI, DISTRICT GUNA.—Krishna Kumar of Museums Branch of the Survey located two stone age sites near Chanderi. The early stone age tool types included handaxes, choppers, etc. of coarse grained quartzite from the bed of Angra Khar near Singhpur village. In the adjoining hillock, Siddha-Baba-ki-Pahari are some rock-shelters, which have been recently converted into Brahmanical shrines. Middle stone age[v]tools such as handaxes, flake blades and scrapers were also collected from a factory site on the top of hill, Malmal Pahar near a locality called Malan Khoh. Some rock-shelters were also noticed in the vicinity.

36. GROUP OF TEMPLES, BADKESHVARA, HARSUD, DISTRICT HOSHANGAUAD.—P.K. Mishra of the Bhopal Circle of the Survey noticed remains of a group of temples belonging to Paramara period near Badkashvara on the bank of the Narmada.

37. MEDIEVAL SCULPTURES, DISTRICT KHARGONE.—B.L. Nagarch of the Temple Survey Project, Northern Region of the Survey discovered Brahmanical sculptures such as seated Brahmi, Mahesvari, Kaumari, Vaishnavi, Varahi, Aindri and Virabhadra kept on the platform of Baghesvari Mata temple at Bonn and ten aimed Chamunda seated in *lalitasana* on a corpse (pi. LII B), eight armed dancing Chamunda and standing Sita-Rama near the Hirai Mata temple, Hirapur.

38. SCULPTURE, DISTRICT MORENA.—L.P. Pandey of the Department of Archaeology and Muse ums, Government of Madhya Pradesh, discovered sculptures of Jaina pantheon like *Tirthankaras,*

Ambika, etc., and Saiva sculptures at Dubkhund in course of debris clearance. These sculptures are assignable to *circa* ninth-tenth century.

39. ClIALCOLITIIIC SITE AND RUINED STRUCTURES, KOTWAR, DISTRICT MORENA.—A chalcolithic site and ruined structures, ring wells, etc. were noticed by P.K. Mishra of the Bhopal Circle of the Survey.

40. IMAGE OF BUDDHA, NACHNA, DISTRICT PANNA.—An image of Buddha, seated in *padmasana* and in *dharamachakra-pravanana-mudra* was noticed by B.L. Nagarch of the Temple Survey Project, Northern Region of the Survey. Both the hands of the figure have been chopped off. On the pedestal is carved a wheel flanked on either side by a deer. The sculpture is assignable to sixth century AD.

41. MEDIEVAL SCULPTURES, RAJGARH, DISTRICT RAJGARH.—B.L. Nagarch of the Temple Survey Project, Northern Region of the Survey noticed medieval sculptures of ten-armed dancing Ganesa, eight-armed dancing Bhairava, two Asvinikumaras standing in *tribhanga* and fragmentary Ashtavasu panel showing six of the eight Vasus each standing in *tribhanga* and carrying a *kamandalu* by his left hand.

42. SCULPTURE AND MOUND, DISTRICT SARGUJA.—An unique image of Vaikuntha was discovered from Deepadih temple complex by the team of the Directorate of Archaeology and Museums, Government of Madhya Pradesh.

Besides, Vinod Joshi of the same Department also noticed an ancient mound at the top of the Ramgarh hills. The surface collection included early historical pottery, coins, beads, terracotta figurines of Sunga-Kushana period.

43. BRAHMANICAL SCULPTURES, DISTRICT SHAHDOL.—A.L. Pathak of the Department of Archaeo logy and Museums, Government of Madhya Pradesh, carried out debris clearance at Antra, a Sakta centre of the Kalachuri period and collected Brahmanical sculptures from the site.

44. REMAINS OF STUPAS, JAFER KHEDA, DISTRICT VIDISHA.—C. Krishna of the Department of Archaeology and Museums, Government of Madhya Pradesh, located remains of a group of stupas at Jafer Kheda, 40 km north-west of Vidisha, Berasia road, opposite hill tract facing Udayagiri hill.

45. MEDIEVAL STONE SCULPTURES, UDAIPUR, DISTRICT VIDISHA.—B.L. Nagarch of the Temple Survey Project, Northern Region of the Survey discovered sculptures of Brahmanical and Jaina pantheon. Among them mention may be made of Anantasayi Vishnu and standing Ganesa, kept in the compound of Hajariya temple and an image of four-armed seated Ganesa fixed on the western wall of Bada Darwaza at Udaipur and a Jaina *tirthankara* seated in *padmasana* in *dhyana-mudra* at Natha Mohalla.

MAHARASHTRA

46. INSCRIPTIONS, VADGAON, DISTRICT AHMEDNAGAR.—The Aurangabad Circle of the Survey found two inscriptions in Devanagari script engraved in the Siva and Vithoba temples. The inscription is dated Saka 1695 (AD 1773) engraved in the Vithoba temple built by Abaji Sonar.

47. MEDIEVAL MOUND AND LOOSE SCULPTURES, DEHIKIIEL, DISTRICT AKOLA.—Ajit Kumar of the Aurangabad Circle of the Survey noticed a huge mound yielding burnished red, red-slipped and grey wares and architectural fragments, broken loose sculptures of Ganesa, Durga and *yonipitha,* etc., datable to fifteenth-sixteenth century.

48. LOOSE SCULPTURES, ELLICHPUR FORT, DISTRICT AMARAVATI.—Ajit Kumar of the Aurangabad Circle of the Survey noticed loose sculptures of Durga, Krishna, four-armed Vishnu, Nandi and architectural members datable to thirteenth-fourteenth century AD and seated images of Gorakhnatha assignable to seventeenth-eighteenth century AD.

49. ROCK-CUT CAVE, RETALWADI IN TALUK SOEGAON, DISTRICT AURANGABAD.—RN. Kamble of the Aurangabad Circle of the Survey noticed rock-cut cave at Betalwadi.

50. ROCK-CUT CAVES, DHARKUND BANOTI WADI, TALUK SOEGAON, DISTRICT AURANGABAD.—RN. Kamble of the Aurangabad Circle of the Survey located rock-cut caves near Banoti village.

51. MEDIEVAL TEMPLES AND SCULPTURES, PANGAON, DISTRICT LATUR.—Ajit Kumar of the Aurangabad Circle of the Survey noticed a temple and loose sculptures at Pangaon. On plan the temple has a *mukha-mandapa, mandapa, antarala* and a sanctum and detached *mandapa* in front. Among notable sculptures mention may be made *of chaturbhuja* Narasimha, Uma-Mahesvara, four-armed Durga and eight-armed Narasimha in black basalt. On stylistic ground, the sculptures and temple are datable to thirteenth-fourteenth century AD.

52. MEDIEVAL TEMPLE AND SCULPTURES, MANJRAM, DISTRICT NANDED.—Ajit Kumar of the Aurangabad Circle of the Survey noticed a temple and loose sculptures of four-armed Vishnu, *nandi,* Vishnu in stone, all assignable to thirteenth-fourteenth century AD.

53. MISCELLANEOUS OBJECTS, RAIGAD, DISTRICT RAIGAD.— In the course of desilting of the Gangasagar tank, N.N. Sinha of the Aurangabad Circle of the Survey unearthed number of objects including armour, copper coins, belonging to Shivaji; copper coins with Persian legends; brass and copper pots; iron rings; cannon balls of stone and iron; architectural fragments; wooden objects and glazed wares.

While exploring the submergence area of Shilar Project in Karjat taluk, Ajit Kumar of the same Circle also noticed early historical mound yielding brick structures and red ware pottery.

54. LOOSE SCULPTURES AND SATI STONE, RAJAPUR TALUK, DISTRICT RATNAGDU.—While exploring the submergence area of Arjuna Irrigation Project, M. Mahadeviah of the Aurangabad Circle of the Survey discovered two sculptures of Mahishamardini and jaft'-stones assignable to sixteenth-seven teenth and eighteenth century AD respectively.

55. TEMPLES, HERO-STONES AND LOOSE SCULPTURES, PARU, DISTRICT SATARA.—M.R. Dhekane of the Aurangabad Circle of the Survey noticed two ruined Hemadpanti temples and loose sculptures of standing Siva, Ganesa and Naga figures, hero-stones, twenty-six in number and.typical flag-pillar, all assignable to thirteenth-fourteenth century.

56. SCULPTURES, DHABIL, DISTRICT SINDHUDURGA.—M. Mahadeviah of the Aurgangabad Circle of the Survey, in the course of exploration in the submergence area of Saramabala Irrigation Project in Sawantwadi taluk noticed stone images of Mahishamardini and a Lakulisa datable to. eighteenth century AD.

57. TEMPLE AND HERO-AND-SATI-STONES, KHANDALI, DISTRICT SOLAPUR.—M.R. Dhekane of the Aurangabad Circle of the Survey noticed a ruined temple and hero- and san'-stones, all assignable to fourteenth-fifteenth century AD.

58. STONE AGE TOOLS, DISTRICT YEVATMAL.—While exploring the submergence areas of Hiwara, Mangali and Nawargaon Tank Projects, M. Mahadeviah of the Aurangabad Circle of the Survey collected middle palaeolithic tools at Palegaon in Moregaon taluk and middle palaeolithic tools, historical and medieval pottery, loose sculptures of Gaja-Lakshmi, Uma-Mahesvara, *yonipitha,* four-armed Vishnu, etc. at Nawargaon taluk.

Ajit Kumar of the same Circle also collected microliths from Chopdoh. The tool types included fluted cores and blades, made of chalcedony.

MANIPUR

59. ASH MOUND, NINGEL, DISTRICT THOUBAL.—The Department of Archaeology, Government of Manipur, in the course of exploration reported the discovery of a huge ash-mound. Besides, potsherds with carved paddle, cord marks, a piece of brass vessel and other objects were also found.

MIZORAM

60. ANCIENT CAVES, ZOTE, DISTRICT AIZAWL.—The Department of Education and Human Re sources, Government of Mizoram, located six caves, locally known as Mura Puk around Zote village about 16 km east of Aizawl.

RAJASTHAN

61. INSCRIBED PILLAR, SAWAI MADHOPUR, DISTRICT BHARATPUR.—B.M.S. Parmar of the Department of Archaeology and Museums, Government of Rajasthan, discovered a *yupa-pillar* inscribed in Brahmi characters of third century AD.

62. PAINTED ROCK-SHELTERS, DISTRICT BHILWARA.—Jagat Narayana of the Department of History, Government College, Kota, discovered and located number of painted rock-shelter at Bhimlat, Gopichand ka-Chhaja, Khoki Hathi-tat, Jharian, Jognimata, Medaki-Mahadeva and Menal.

63.TEMPI.ES, RAWATBHATA, DISTRICT CHITTAURGARH.—O.P. Sharma of the Department of Archaeology and Museums, Government of Rajasthan, noticed three *nagara* style temples, dedicated to Mahadeva, Vishnu and Lakshmi, all datable to eighteenth century AD.

64. SATI-SLABS FROM DISTRICT CHURU.—Kishan Lai of the Government Museum, Bikaner, of the Department of Archaeology and Museums, Government of Rajasthan noticed sari-stone slabs at Chapar and an image of Ganesa in the Tehsil Sujangarh and Changoi in Tehsil Taranagar. The slabs range in date from VS 1311 to 1724. The slab from Changoi bears an inscription mentioning *the sati* of two wives Bhatiyani and Kachawahi of Banmali Das, who happened to be the son of Maharaja Karan Singh, one of the rulers of Bikaner and it is dated 1724, Margshirsha, Shukla 13.

65. BRONZE IMAGES, GORU, DISTRICT NAGAUR.—S.N. Sinha of the Department of Archaeology and Museums, Government of Rajasthan, discovered ten bronze images of Jaina *tirthankaras,* datable to tenth-eleventh century AD.

66. MURALS, DISTRICT PALI.—In the course of Survey Prakash Bapna of the Department of Archaeology and Museums, Government of Rajasthan, noticed murals having *Ramayana, Mahabharata* and Jaina themes belonging to eighteenth-nineteenth century at Achalgarh, Adorn, Badli, Balunda, Boya, Chundawal, Ghanerao, Jaitaran, Palariya, Rohit, Salesar, Sewadi and Sewariya.

TAMIL NADU

67. MEGALITIIIC SITE, DISTRICT PUDUKKOTTAL— D. Dayalan of the Madras Circle of the Survey located an extensive megalithic site at Odiyamangalam and Kalayepalle.

68. ROCK-PAINTINGS, TIRUMAYAM, DISTRICT PUDUKKOTTAI.—D. Dayalan of the Madras Circle of the Survey, during explorations discovered paintings on a boulder within the fortification walls at Tirumayam. The paintings, executed on the lower part of the boulder in red ochre depicting hunting scenes. On stylistic basis it can be dated to the beginning of the Christian era.

69. INSCRIBED HERO-STONE, DISTRICT THANJAVUR.—An inscribed hero-stone was discovered by D. Dayalan of the Madras Circle of the Survey near the Airavatesvara temple at Darasuram. The inscription states that one Porpiraman of Kilvelur sacrificed his life while'defending the village. On palaeographic ground it can be assigned to AD 850-950.

UTTAR PRADESH

70. POTTERY AND SCULPTURES, FATEIIPUR SIKRI, DISTRICT AGRA.—C.P. Singh and Makrand Prasad of the Agra Circle of the Survey discovered the sites yielding PGW and red ware at Sultanganj and sculptures of Hamsa from the field near Dak Bungalow at Fatehpur Sikri.

71. POTTERY I-KOM IRADAT NAGAR, DISTRICT AGRA.—C.P. Singh of the Agra Circle of the Survey picked up potsherds of black and red ware and PGW from the mound known as Sarhwarah in the vicinity of Iradat Nagar.

72. SCUIJTURE, MARMARA, DISTRICT ETAH.—C.P. Singh of the Agra Circle of the Survey collected an metal image of Venugopala, assignable to sixteenth-seventeenth century AD.

73. FRAGMENTARY BRICK INSCRIPTION, ERICH, DISTRICT JHANSI.—Three-lined fragmentary brick inscription was found by Om Prakash Lai Srivastava, Government Museum, Jhansi. The inscription reads *(sa) tanika (sva) senapaii dasarnadhipaii mula...(D) sarnaswaran Vasisthiputra Asadha.* Palaeographically it can be assigned to second century AD.

74. MEDIEVAL sire AND SCULPTURE, ATA, DISTRICT LUCKNOW.—Girish Chandra Singh of U.P. State Archaeological Organization discovered site yielding knobbed lids, knife-edged bowls, terracotta bangles and red ware of medieval period from a small mound. He also noticed a beautiful seated stone image of Parsvanatha and other architectural pieces belonging to ninth century AD.

75. BRICK TEMPLE REMAINS AND SCULPTURES, BIRAPURA, DISTRICT LUCKNOW.—Rakesh Tiwari of U.P. State Archaeological Organization located temples, sites and sculptures belonging to early medieval period. The sites are locally known as Chaturbhuja Baba, Mandhaka maharani, Devara, Thakura and Chabutara Janaki Charana Baba. Doorjambs, *Uttaranga mandaraka,* etc., and several sculptures were also noticed. Besides, medieval sculptures and pottery were also located.

76. REMAINS OF TEMPLES AND SCULPTURES, PANCHAMUKHI PAHARA, DISTRICT MIRZAPUR.—Girish Chandra Singh of the U.P. State Archaeological Organization noticed architectural remains and sculptures including Kalyariasundara, Parvati, Uma-Mahesvara, Ganesa, Ganga, Kartikeya, Vishnu, Surya, etc., ranging in date from early to late medieval period.

77. INSCRIBED IMAGE, JARIGIGARH, DISTRICT RAE BARELI.—Girish Chandra Singh of the U.P. State

Archaeological Organization discovered a *sthanaka* stone image of Rsabhanatha. The pedestal bears inscription in late medieval Nagari script.

78. ANCIHNT SITE, THMPU-: AND SCULPTURES, DISTRICT SULTANPUR.—Girish Chandra Singh of the U.P. State Archaeological Organization discovered sites yielding black slipped and red wares and three brick temple remains and number of early and late medieval sculptures at Narahi and an early late medieval stone image of Surya in *samabhanga* pose from Vikahara.

79. BRICK TEMPLE REMAINS, SARAWA, DISTRICT VARANASI.—Remains of brick temple and stone sculptures of Kubera and Ganesa belonging to early medieval period were discovered by Girish Chandra Singh of the U.P. State Archaeological Organization.

V. RADIOCARBON DATES[1]

Radiocarbon dates[2] measured from archaeological and Quaternary samples are presented in the following pages. All the dates are based on 5730±40 years, half-life value of radiocarbon and are uncorrected for $^{14}C/^{12}C$ variation. 1950 is the base year for converting the dates into AD/BC. The sites[3] are arranged Statewise and alphabetically.

GUJARAT

I. ARABIAN SEA OFF SAURASHTRA COAST

i. PRL-1307. Quaternary Sediment cores from 60-70 cm depth, Site Station No. 3943 — 4270±120 (2320 BC)

ii. PRL-1308. Quaternary Sediment cores from 80-90 cm depth, Site Station No. 3943. — 5770±140 (3820 BC)

iii. PRL-1314. Quaternary Sediment cores from 40-45 cm depth, Site Station No. 3952 — 4860±100 (2910 BC)

ARABIAN SEA OFF KARNATAKA COAST

i. PRL-1322. Marine sediment Sediment cores, 36% $CaCO_3$, depth 10-15 cm. Sample no. 1, CA. — 4810 ±110 (2860 BC)

ii. PRL-1323. Marine sediment Sediment cores, 36% $CaCO_3$, depth 40-45 cm. Sample No. 2, CA. — 12910^{+450}_{-430} (10960 BC)

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[1]Contributed by D.P. Agrawal, Shccla Kusumgar and M. Yadav of the Physical Research Laboratory, Ahmedabad.

[2]For further details of the samples the submitting organizations may be contacted.

[3]Sample submitted by : 1, N.I.O., Dona Paula, Goa; 2, Department of Marine Geology, Mangalore University, Mangalore; 3, Kurukshetra University, Kurukshetra; 4, University of Madras, Madras; 5, School of Geography, University of Oxford; 6, Department of Archaeology and Museums, Government of Madhya Pradesh, Easten Region, Jabalpur; 7, NGRI, Hyderabad; 8, Archaeological Survey of India, Purana Qila, New Delhi; 9, Hindustan Zinc Ltd., P.O. Zawar Mines, Udaipur ; 10, Department of Epigraphy, Tamil University, Thanjavur; and 11, Department of Archaeology, Government of Tamil Nadu.

iii. PRL-1325. Marine sediment Sediment cores, 36% $CaCO_3$, depth 7.0-75 cm. Sample No. 3, CA. — 17630^{+360}_{-310} (15680 BC)

iv. PRL-1326. Marine sediment Sediment cores, 36% $CaCO_3$, depth 95-100 cm. Sample No. 4, CA. — 26120^{+1230}_{-1070} (24170 BC)

v. PRL-1327. Marine sediment Sediment cores, 36% $CaCO_3$, depth 115-129 cm. Sample No. 5, CA. — 29990^{+2680}_{-2020} (28040 BC)

HARYANA

3. BALU, DISTRICT JIND

i. PRL-985. Harappan Culture Charcoal form Trench Q5, layer 5, depth 0.60 m, Sample No. 2. — 2390±110 (440 BC)

ii. PRL-989. Harappan Culture Charcoal from Trench Q6, layer 11, depth 1.30 m, Sample No. 6. — 3350±150 (1400 BC)

JAMMU AND KASHMIR

4. SI-MTHAN, DISTRICT ANANTNAG

i. PRL-959. Period III (Indo-Greek), Charcoal from layer 23, Sample No. SMN-81/CC-9. — 1780±130 (AD 170)

ii. PRL-946. Period II (NBP), Charcoal from layer 32, Sample No. SMN-91/CC-17. — 1940±120 (AD 10)

5. KOLAHOI GLACIER

PRL-1122.Wood — 840±90
Wood protruding from till, — (AD 1110)
Sample No. Kolahoi 4.

MADHYA PRADESH

6. KAKRAHTA, DISTRICT JABALPUR

i. PRL-1054. Maurya-Sunga, Charcoal from Trench KRT-I, Layer 11, depth 2.33 m below surface. Sample No. 15. — 2380±120 (430 BC)

ii. PRL-1051. Maurya-Sunga, Charcoal from Trench KRT-1, Layer 10, depth 1.96 m below surface. Sample No. 9 — 2950±120 (1000 BC)

MEGHALAYA

7. MENDIPATHAR, DISTRICT EAST GARO HILLS

i. PRL-1027. Prehistoric earthquake Dry wood from 3-30 m, depth below surface Sample No. 4.1. — 1110±100 (AD 840)

PUNJAB

8. SANGHOL, DISTRICT LUDHIANA

i. PRL-1269. Early Kushana Level, Charcoal from Trench BX-1, Layer 24, depth 5.45 m. Sample No. SGL/CC-4 — 2130±140 (180 BC)

ii. PRL-127-1. Kushana period, Charcoal from Trench BX-1, Layer 20, depth 4.70-m. Sample No. SGL/CC-6. — 1600±120 (AD 350)

iii. PRL-1274. Kushana period, Charcoal from Trench D-3, Layer 15, depth 2-14 m. Sample No. SGL/CC-9. — 2570±110 (620 BC)

iv. PRL-1277. Kushana period, Charcoal from Trench XB2 Layer 8, depth 3.45 m. Sample No. SGL/CC-13. — 2310+120 360 BC)

RAJASTHAN

9. ZAWAR MALA MINE, DISTRICT UDAIPUR

i. PRL-934. Ancient Mining, Charcoal from old working, reduced level 540 m. Sample No. ZM/7. — 750±130 (AD 1200)

TAMIL NADU

10. VALLAM, DISTRICT THANJAVUR

PRL-1111. Black-and-Red Ware, Charcoal from Trench VIM-1, Layer 9, depth 2.10—2.15 m. Sample No. 6. — 2420±120 (470 BC)

ii. PRL-1110. Black-and-Red Ware, Charcoal from Trench VLM-1, Layer 9, depth 2.0 m below surface, Sample No. 5. — 2920±140 (970 BC)

iii. PRL-1109. Black-and-Red Ware, Charcoal from Trench VLM-1, Layer 9, depth 1.92 m below surface, Sample No.4. — 2980±110 (1030 BC)

iv. PRL-1108. Early historic period, Charcoal from Trench VLM-1, Layer 8, depth 1.55 m below surface, Sample No. 3: — 1340±100 (AD 610)

11. ALAGANKULAM, DISTRICT RAMANATHAPURAM

i.	PRL-1296.Period-II, Charcoal from Trench AGM-2, Layer 2, depth 1.40 m below surface. Sample No. 1.	2150±110 (200 BC)
ii.	PRL-1297. Period-II, Charcoal from Trench AGM-2, Layer 3, depth 1.55 m below surface. Sample No. 2.	2210±110 (260 BC)
iii.	PRL-1298. Period-II, Charcoal from Trench AGM-2, Layer 3, depth 1.90 m below surface, Sample No. 3.	2310±130 (360 BC)
iv.	PRL-1299. Period-III, Charcoal from Trench AGM-2, Layer 5, depth 2.80 m below surface. Sample No. 4.	2330±110 (380 BC)

VI. PALAEOBOTANICAL AND POLLEN ANALYTICAL INVESTIGATIONS[1]

KARNATAKA

1. HALLUR, DISTRICT DHARWAR.—Palaeobotanical investigations on the plant remains recovered during 1976 season's excavations at Hallur brought to light six wild and cultivated plant species from transitional levels between neolithic and megalithic cultures. The plant species include rice (*Oryza sativa* Linn.), lablab bean (*Dolichos lablab* Linn.), horse gram *(Dolichos biflorus* Linn.), black gram *Vigna mungo* (L.) Hepper, green gram (*Vigna radiata* (L.) Wilcrek, and Indian jujube (*Zizyphus* cf. *jujuba* Lamk.). The plant remains are dated to 1000 BC on ceramic grounds.

MAHARASHTRA

2. MAHURZARI AND RAIPUR, DISTRICT NAGPUR.—Pollen analysis of eight samples occurring in association with copper objects recovered during the course of excavation at the megalithic site of Mahurzari and Raipur were studied with a view to assess the supposed role of copper salts in the preservation of pollen and spores. In all the samples, fungal spores were predominantly found whereas there is near absence of pollen. Besides microfossils, all the samples were analyzed for determining the percentage of copper salts. Soil samples adhering to the copper objects contain 0.2 to 6.5 percent copper and the control samples from the stone circles (but not adhering to the copper objects) contain 0.023 to 0.027 percent copper.

In view of the antifungal and anti-bacterial property of copper salts (especially copper sulphate), one would expect better preservation of the microfossils in the soil samples adhering to the copper objects. Interestingly, it was observed that the microfossils, especially pollen are absent in the samples. Analysis of pollen was made irrespective of whether they were adhering to the copper objects or not. This seems to be due to the fact that the soil samples had probably become deficient in pollen before coming into contact with the copper objects.

UTTAR PRADESH

3. LAL QILA, DISTRICT BULANDSHAHAR.—The plant remains recovered during the course of excavation at Lal Qila were analyzed. The investigation revealed the presence of barley (*Hordeum-vulgara* Linn.), husk of rice (*Oryza* cf. *sativa* Linn.), wheat (*Triticum* cf. *sphaerococcumers* and *Triticum* of. *aestivum* Linn.), cucurbitaceous seed, broken portion of a seed coat and indeterminate seed.

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[1]Contributed by: 1-4 and 7, M.D. Kajale and B.C.Deotare of the Deccan College, Postgraduate and Research Institute, Pune; and 5-6, K.S. Saraswat, D.C. Saini, N.K. Sharma and Chanchala of the Birbal Sahni Institute of Palacobotany, Lucknow.

4. ATRANJIKHERA, DISTRICT ETAH.—The samples from Atranjikhera revealed the presence of rice husk (*Oryza* cf. *Sativa* Linn.) from Kushana to post-Kushana levels and two pieces of uncarbonized weed seeds (tentatively diagnosed as *Tribulus* sp.) from the Kushana to post-Kushana levels.

5. NARHAN, DISTRICT GORAKHPUR.—Analytical studies of the plant remains from Narhan (26° 19' N; 83° 24' E) have added considerable information on the past crop economy and the vegetation growing around the site during 1000-200 BC.

The plant remains collected from different cultural horizons at Narhan are as under:

A. PERIOD I (BLACK & RED WARE PHASE : 1000 - 800 BC):

(i) Crops : Rice (*Oryza sativa*), barley (*Hordeum vulgare*), wheat (*Triticum sphaerococcum, T. aestivum* and *T. compactum*), kodon-millet *(Paspaluni scrobiculatum),* pearl-millet or *bajra* (*Pennisetum typhoides*), chick-pea or gram (*Cicer arietinum*), common-pea (*Pisum sativum* var. *arvense*), green-gram or *mung* (*Vigna radiata*), horse-gram (*Dolichos biflorus*), grass-pea (*Lathyrus sativus*), lentil *oxmasoor* (*Lens culinaris*), aconitebean or *moth* (*Vigna-aconitifolia*), field-Brassica (*Brassica juncea*), sesame or *til* (*Sesamum indicum*) and lin- seed or flax (*Linum usitatissimum*).

(ii) Weeds & wild seeds : *Fimbristylis tetragona, F. dichotoma, F. tenuicula, Rhynchospora liookeri, Cyperus* sp., *Eleocharis* sp., *Dactyloctenium aegyptium.Andropogon* sp., *Pancium* sp., *Cenchrus ciliaris, Poa* sp., *Echinochloa crusgalli, Polygonum barbatum, Rumex detatus, Lolium, temidentum, Amaranthus* sp., *Chenopodiwn album, Cucumis* sp., *Trianthema portulacastrum, Ipomoea pestigridis, Oldenlandia dichotoma, Argemone mexicana, Rhynchosia minima, Trigonella occulta, Vicia sativa, lndigofera* sp., *Desmodium* sp., *Lathy rus aphaca, Cleome viscosa, Sida* sp., *Malvestrum Coromandelianum* and *Commelina benghalensis.*

(iii) Edible fruits: Jujube or *ber (Zizyphus nummularia),* grape, possibly raisin or currants *(Vitis vinifera),* date *(Phoenix dactylifera)* and jack-fruit or *katahal (Artocarpus heterophyllus).*

(iv) Fibre : ramie *(Boehmeria nivea)* used for fishing thread.

(vi) Wood Charcoals: *Dhak (Butea monosperma), karanj (Derris indica), dhera (Diospyros montana), mahua (Madhuca indica),* mango *(Mangifera indica), babul* or *khair (Acacia* sp.), mulberry or *shahtoot (Morus alba),* holy basil or *tulasi (Ocimum* cf. *Sanctum), arni* or *Ganiyari (Premna mucronata), sal (Shorea robusta), kuchla (Strychnos nux-vomica), imli (Tamarindus indica), Jhau (Tamarix dioica),* teak or *sagaun (Tectona grandis), siris (Albizia lebbeck/A. procera), gurch* or *giloi (Tinospora cordifolia)* and bamboo.

B. PERIOD II (BLACK-SLIPPED WARE PHASE : 800 - 600 BC):

(i) Crops: Among the carbonized grains rice, barley, field-pea and green-gram were of the same kind as found from Period I. However, safflower *(Carthamus tinctorius)* is a new find from this phase.

(ii) Wood charcoals : *Babullkhair (Acacia* sp.), *mahua (Madhuca indica), Sheesham* or *sissoo* (*Dalbergia sissoo*), *dhera* (*Diospyros montana*), *emblic* or *anwla* (*Emblica officinalis*), *kaim* (*Mitragynaparyifolia*), *sal* (*Shorea robusta*), *imli* (*Tamarindus indica*), *jamun* (*Syzygium cumuni*), teak (*Tectona grandis*), mango (*Mangifera indica*) and bamboo.

C. PERIOD III (NORTHERN BLACK POLISHED WARE PHASE : 600-200 BC):

(i) Crops: Food grains of rice, barley, dwarf and bread wheat, *kodon*-millet, green gram, field-pea, grass-pea and oil-seed of sesame or *til* were of same types already known from Period I. Black gram (*Vigna mungo*) is a new find from this phase.

(ii) Fruits : *Ber* or jujube (*Zyzyphus mauritiana*) and *anwla* (*Emblic officinalis*).

(iii) Reed plants and Cuticle remains: Bamboo and *kusha* stems (*Saccharum spontaneum*) were used to support the mud walls of some hut-like houses. Straw of rice (*Oryza saliva*) was used as degraissant in the clay used for plastering of mud wall. Cuticle remains of wild grass (*Desmostachya bipinnata*) and bamboo were also encountered.

(iv) Wood Charcoals: *Dhaura* (*Lagerstroemia paryiflora*), *mahua*(*Madhuca indica*), holy-basil *or tulasi* (*Ocimum* sp.) *Cheer-pine* (*Pinus roxburghii*), sandal wood (*Santalum album, imli* (*Tamarindus indica*), mango (*Mangifera indica*), *punarnava* (*Boerhavia diffusa*) and bamboo.

6. HULASKHERA, DISTRICT LUCKNOW.—The carbonized grains of crop plants from different cultural horizons at Hulaskhera, dating back from 700 BC to AD 500, were identified as of rice (*Oryza sativa*), barley (*Hordeum vulgare*), dwarf wheat (*Triticum sphaerococcum*), bread-wheat (*T. aestivum*), *jowar* millet (*Sorghum bicolor*), finger-millet (*Eleusine coracana*), oat (*Avena* sp.), field-pea (*Pisum sativum* van *Arvense*), grass-pea (*Lathyrus sativus*) and green-gram (*Vigna radiata*).

A number of weeds and wild seeds were identified as belonging to *Lathyrus aphaca, Poa, Panicwn, Andropogon, Chenopodium, Indigofera, Trigonella, Fimbristylis, Polygonwn plebejwn, Desmodium, Trianthema, Dactyloctenium, Commelina, Sida, Elaeocharis, Scirpus, Carex* and *Salmalia malabarica.*

Among wild fruits were *ber* (*Zizyphus* sp.) and *bahera* (*Terminalia belerica*)

7. DAMDAMA, DISTRICT PRATAPGARH.—In continuation of the pollen analytical investigations on the lake sediments adjacent to the mesolithic habitational site of Damdama reported partially during the earlier year, the rarity of microfossils (pollen and spores) was investigated chemically by analyzing the sediments for hydrogen ion concentration (pH), oxidation potential (Eh) and organic carbon content.

The pH of the sediment profile (divisible into 18 samples) ranges between 6.8 to 8.2, indicating near neutral to slightly alkaline nature. In general, the organic carbon content is very low, ranging from 0.01 to 0.35 percentage, except for the uppermost sample which contains 1.01 percent organic carbon. This is essentially because of the modern surface vegetation which contributes higher organic carbon to the uppermost levels as compared to the lower levels exposed in the trench. Oxidation potential of the eighteen samples ranges from 0.013 to 0.09.

The soil conditions such as alkaline nature, low values of the organic carbon content and the low oxidation potential could have been the factors responsible for poor preservation of the microfossils. Using Garrel's (1966) model, Eh and pH values were plotted on the graph. They distinctly fall within the one ground water. The limonitized clay specks are common in the pollen profile. This speaks in favour of intermittent exposure of the sediments and this must have been essentially because of ground water fluctuations, which in turn could have been responsible for poor preservation of microfossils.

VII. MUSEUMS

1. TAJ MUSEUM, AGRA.—Electric re-wiring and anti-termite treatment has been done during the period under review.

2. GOVERNMENT MUSEUM, AHAR.—New wall showcases were prepared and lighting arrangements improved.

3. GOVERNMENT MUSEUM, AJMER.—The Epigraphy section of the museum was re-organized and showcases of the Jaina Gallery were repaired.

4. GOVERNMENT MUSEUM, ALMORA.—The museum collection is enriched by the addition of one hundred twenty-one coins including nine gold coins of Kushana and Gupta periods, seventy-one silver punch-marked coins and forty-one copper and eleven sets of commemorative coins.

A new gallery of folk arts was also added to the existing galleries of Art and Archaeology. Under educational programme, slide and video-cassette shows for students and general public were also organized in the museum. Besides undertaking photo-documentation of museum collections, twenty art objects were also chemically treated and preserved.

5. GOVERNMENT MUSEUM, ALWAR.—New pedestals were prepared and lighting arrangements improved.

6. ARCHAEOLOGICAL MUSEUM, AMARAVATI.—The museum collection was further enriched by addition of an inscribed image of Buddha in limestone, datable to sixth-seventh century AD and five copper-plates including three belonging to the Chalukyan and two of early Pallava periods.

Besides, the *Yaksha* and three uprights of granite railing of Mauryan period, set up in the corridor of the museum were shifted and refixed on pedestals in the courtyard for display. The interior of the museum was painted with suitable plastic emulsion in different tints to suit the display of objects in the galleries.

7. GOVERNMENT MUSEUM, AMBER.—The organization of new Art Gallery was taken up and pedestals and showcases were prepared. The work is in progress.

8. GOVERNMENT MUSEUM, BHARATPUR.—During the year under review, nine sculptures were added to the museum collection. The walls and doors were repainted and showcases repaired.

9. GOVERNMENT MUSEUM, BIKANER.—During the year under review, introductory and descriptive boards for new Jaina gallery were prepared.

10. PRINCE OF WALES MUSEUM, BOMBAY.—During the year under review, the museum collection, was enriched by acquisition of seventy-two art objects.

The museum also participated in the exhibitions on *Maritime India—Tradition and Progress* held at Museum of Natural History at Port Louis, Mauritius, from 6 September to 13 September 1987 and *Mirror of Beauty : Art Treasures from India* at Stockholm as a part of Festival of India from 7 October 1987 to 3 January 1988; and coloured photographic enlargements of the wall paintings from Alchi Monastery, Ladakh, by Jaroslav Poncar and Barbara Luttenbeck in collaboration with the Max Mueller Bhavan, Bombay, from 14 March to 25 March 1988.

The Museum also conducted a Summer Art Course for pottery making for children from 4 to 9 May 1987 and Coomarswamy Memorial Lectures: *Art of Ancient Chamba* by Pratapaditya Pal on 24 and 25 July 1987.

The Library collection of the museum was also enriched by addition of one hundred eighty-nine new books and two hundred and seventeen periodicals.

Indian Art by Moti Chandra (Fourth revised edition) and Catalogue of the Festival of India Exhibition : *Mirror of Beauty : Art Treasures from India,* edited by Sadashiv Gorakshakar were published during the period under review.

11. ARCHAEOLOGICAL MUSEUM, CHANDRAGIRI.—The museum collection has been enriched by an acquisition of ninety-eight stone and bronze sculptures of late Vijayanagara period from Chandragiri and Gandikota. The organization of bronze, sculpture and miscellaneous galleries were completed.

12. GOVERNMENT MUSEUM, CHITTAURGARH.—During the period under review, lighting arrangements of the museum was improved.

13. MATTANCHERRY PALACE MUSEUM, COCHIN.—The organization of Gallery 6 has been completed.

14. DATIA MUSEUM, DATIA.—The museum has been organized at Rajgarh palace. The art objects have been displayed in the different galleries.

15. ARCHAEOLOGICAL MUSEUM, HALEBID.—The reserve collection to the east of sculpture gallery was reorganized.

16. ARCHAEOLOGICAL MUSEUM, HAMPI.—The museum acquired six art objects during the year under review. A shrine *Vijayanagara Pavilion* has been set up on a huge platform with available architectural materials. The dancing figures have been mended with matching colour and tonal effect. Two lion balustrades have been installed on both sides after fixing the broken pieces with steel rods and araldite. The existing old scale model of Hampi ruins has been renewed by providing stone pavements around the scale model and erecting railing to restrict the movements of the visitors.

17. GOVERNMENT MUSEUM, HAWAMAHAL, JAIPUR.—Reorganization and exposition work of the galleries was undertaken. Lighting systems were improved and new pedestals prepared for the display of sculptures.

18. GOVERNMENT MUSEUM, JAIPUR.—The painting gallery was reorganized and lighting arrangements have considerably been improved.

19. GOVERNMENT MUSEUM, VIRATNAGAR, JAIPUR.—A new museum was opened. Four galleries on prehistory protohistory, sculptures, inscriptions and coins have been set up.

20. GOVERNMENT MUSEUM, JAISALMER.—The entire galleries of the museum were reorganized and four new wall showcases prepared for display.

21. GOVERNMENT MUSEUM, JHALAWAR.—Proper lighting arrangements in the galleries have been made and the work of reorganization for proper display of exhibits was taken up.

22. GOVERNMENT MUSEUM, JODHPUR.—The museum galleries were repainted and steps have been taken for proper lighting arrangements.

23. ARCHAEOLOGICAL MUSEUM, KONARAK.—The old pedestals in Gallery 1 and 2 have been reveneered with teak finish sunmica. A gateway depicting ornamental designs and wheel of the temple has been provided.

24. GOVERNMENT MUSEUM, KOTA.—The exhibits were classified on scientific lines. Showcases were given new shapes. Steps were taken for proper lighting arrangements in the museum.

25. FORT ST. GEORGE MUSEUM, MADRAS.—During the period under review, the enlarged colour photographs of the museum objects were displayed. The false ceiling of the gallery was painted with white plastic emulsion for better reflection of light. Besides, the lighting arrangements in Gallery 1, 5 and 10 were also improved.

26. SHRIMATI BAI MEMORIAL MUSEUM, MANGALORE.—The museum acquired one folk bronze image from Tehsildar, Puttur, District Dakshina Kannada.

27. GOVERNMENT MUSEUM, MATHURA.—During the year under review, the museum collection was further enriched by the acquisition of seventy-eight sculptures; forty- terracotta objects; seven hundred thirty three manuscripts; thirty four paintings; ten textiles; twenty-six metal objects; thirteen gold, eight hundred nine copper and three hundred sixty-nine silver coins; one harpoon and seven clay seals. Important among them are life-size image of *yaksha* (first century BC) from Bharna Kalan Goverdhan (pl. LIII A); image of Surya (pl. LIIIB) in buff sandstone (medieval period) from Madaur, District Mathura; and terracotta plague depicting fight between child and a lion in red clay, assignable to Sunga period.

The museum also organized a series of lectures on different aspects *Aryon ka Adidesh Bharat* by Shankar Lal Chaturvedi; *Some principles about the original place of Aryans* by S.K. Avatar; *Indian*

Culture and Naga Worship by J.K. Mudgal; *The relation of Vakataka and Gupta Kings and its effect on history* by Shyam Manohar Misra and *Situation of the Spots of Ramayana Age* by Dwarika Prasad Gautam and two illustrated lectures on *Archaeology of Mathura and its contribution to Indian history* by M.C. Joshi under 8th Growse Memorial lectures in January 1988.

During the year under review the museum also arranged four temporary exhibitions on *Kalaratna of Manasi Ganga, New Acquisitions of 1988 and the medieval sculptures, Antiquities acquired in 1987,* and *Chemical Treatment and Preservation of manuscripts.*

Under the educational programme the school children were also shown documentary films on art, history, culture, etc.

28. GOVERNMENT MUSEUM, MOUNT ABU.—New pedestals were prepared for the display of sculptures and old pedestals reshaped. The showcases and pedestals were also repainted.

29. HAZARDUARI PALACE MUSEUM, MURSHIDABAD.—The Portrait gallery of the Nawab Nazims of Murshidabad, Billiard room, Durbar hall, Committee room, British portrait gallery and the landscape gallery were reorganised (pls. LIV-LV). The restoration of stucco work on the inner surface of the dome of durbar hall and renovation of booking counters was also undertaken.

30. NATIONAL MUSEUM, NEW DELHI.—During the year under review, the museum collection is further enriched by acquisition of two hundred and forty-one stone sculptures, two bronzes and seventy-five minor antiquities. Two hundred and ninety-two anthropological objects (pl. LVI), a good number of late Kangra paintings, fifty two Hindi and Sanskrit manuscripts and one match lock gun were also added in the collection.

31. ARCHAEOLOGICAL MUSEUM, NALANDA.—Reveneering work of gallery has been completed. A 3.5 KVS Diesel Generator has been installed.

32. ARCHAEOLOGICAL MUSEUM, PURANA QILA, NEW DELHI.—The organization of gallery 2 has been completed with the display of objects.

33. GOVERNMENT MUSEUM, PALI.—The antiquities discovered from Godvad region of Rajasthan were added to the museum collection.

34. PATNA MUSEUM, PATNA.—During the year under review the museum acquired one thousand six hundred and thirty-seven copper coins of Muhammad Shah, one hundred and thirty one copper coins of later Kushanas and seventeen copper Masaka coins.

35. ARCHAEOLOGICAL MUSEUM, SANCHI.—One Vishnu head in red sandstone datable to Gupta period was added to the collection. Besides, organization work was also taken up in the main hall.

36. ARCHAEOLOGICAL MUSEUM, SARNATH.—Galleries were painted and the antiquity stores were treated with anti-termite during the period under review.

37. DISTRICT MUSEUM, SIHMOGA.—During the year under review the museum collection is enriched by acquisition of one *Adi tirthankara* images from Gundappa shed. The sculptural gallery was also re-arranged.

38. GOVERNMENT MUSEUM, UDAIPUR.—During the year under review eight new pedestals were prepared and old pedestals were repaired and repainted.

39. ARCHAEOLOGICAL MUSEUM, VAISHALI.—Gallery 3 has been organized with the display of antiquities in six new showcases. Electrification of the showcases in the Gallery 1,2 and 3 has been completed. A generator has also been installed for the illumination of the galleries as well as for the security of the Museum during power failure.

40. ARCHAEOLOGICAL MUSEUM, VELHA GOA.—Portrait paintings of Portuguese Governors in the Galleries and reserve collection have been chemically treated. Coir mat has been provided to the staircase at the key gallery leading to the gallery 6.

41. BHARAT KALA BHAVAN, VARANASI.—During the year under review the museum acquired two hundred fifty-seven coins, twenty sculptures including fifteen ivory, four metal and one wood and two copper-plates.

VIII. ARCHITECTURAL SURVEY

TEMPLE SURVEY : In continuation of last year's (*1986-87,* pp. 137-138) work the Temple Survey Project, (Northern Region) headed by B.L. Nagarch of the Survey carried out survey of the Paramara temples of Malwa. The ruins of a *bhumija* temple at Moina, District Indore, Siva temple and other ruined shrines at Hirapur and Siva temples and Baghesvari Mata temple at Borut, District Khargone, and ruins of Saiva, Vaishnava and Jaina temples at Palnagar, District Dewas, were surveyed.

Only the plinth of the temple at Moina has survived. On plan, the temple consists of a sanctum, an *antarala, sabha-mandapa* and an *ardha-mandapa.* Among the architectural fragments lying at the site could be noticed fragments of *adhishthana* mouldings, stone-slabs of *jangha* decorated with two bands, miniature shrine-models of *bhumija sikhara,* bases of pillars, fragmentary *chaitya-dormers* of *sukanasika* and a stone-slab of the ceiling carved with a full-blown lotus. On the basis of architectural style, the temple can be dated to eleventh century AD.

The Siva temple locally known as Hirai Mata temple at Hirapur is in a ruined state (pl. LVII A). On plan, this temple has a *pancha-ratha* sanctum, an *antarala, sabha-mandapa* and an *ardha-mandapa.* The sanctum enshrines a Siva-*linga* installed on a *yoni-patta.* The sanctum-doorway is elaborately carved with five *sakhas.* On the north of the Hirai Mata temple is another shrine of which only the *pitha* and *adhishthana* mouldings have survived. The shrine consists on plan of a *pancha- ratha* sanctum, an *antarala* and an *ardha-mandapa.* The loose sculptures kept inside the sanctum are those of Varaha, Vaishnavi and Siva. To the north-east of this temple is the Hirai Mata temple which houses the image of Trivikrama. Images of Kaumari, Brahmi, dancing and seated Chamunda are kept inside this shrine. Among the sculptures, kept on the compound-walls of Hirai Mata temple, are those of Vamana, Aindri, Mahesvari, Anantasayi Vishnu, Vaishnavi, Brahma, Sita-Rama, Vishnu, Nirriti, Parvati, Varaha in zoomorphic form and Garuda. The fragments of ceiling stone-slab carved with a full-blown lotus, stone-slabs of *jangha, kirtimukhas,* circular *chaitya*-dormers of the *sukanasa,* fragments of *samvarana* roof of the *sabha-mandapa* and miniature shrine-models of a *bhumija sikhara* can be seen scattered within the premises. On the basis of architectural and sculptural styles, the Hirai Mata temple can be assigned to a date not later than the eleventh century AD. The Siva temple at Borut consists, on plan, of a sanctum, an *antarala* and a *sabha-mandapa* with three *mukha-mandapas* of which one is on the eastern and the other two are on the northern and southern sides (pl. LVII B). The sanctum is intact while the *sabha-mandapa* and the *mukha-mandapas* have collapsed, the ruins of which are lying at the site. The sanctum-doorway is decorated with five *Sakhas.* The lower-portions of the *sakhas* are carved with diamonds on panels instead of the usual figures of river goddesses, *dvarapalas* and attendants. The walb of the *antarala* are plain. Among the loose sculptures kept inside the eastern *mukha-mandapa* arc those of Nandi, Parvati, Siva, Sarasvati, Anantasayi Vishnu, *sthanaka* Vishnu, *dasavatara* Vishnu and Garuda. Among the architectural components, scattered at the site, are the fragments of a circular *chaitya*-dormers of the *sukanasa,* fragments of *adhishthana* mouldings, shafts of pillars, brackets and ceiling stone-slabs.

The Baghesvari Mata temple at Borut is also in a ruined condition. Only the plinth of the temple has survived. On plan, it consists of sanctum, an *antarala* and a *mandapa.* Among the important loose

sculptures kept inside the sanctum are those of the Vishnu, Ganesa, Siva, Brahmi, Mahesvari, Varahi, Kaumari, Vaishnavi, Virabhadra, Brahma and Narasimha. The temple seems to be slightly earlier than the Siva temple and can be assigned to early eleventh century.

The sculptural remains from the Saiva, Vaishnava and Jaina temples at Palnagar are kept at present around a modern temple of Hanuman located in the heart of the village on the bank of Dudhavanti Nala. Among the sculptures are those of Ganesa, Vishnu, Uma-Mahesvara, Lakshmi-Narayana, Chamunda, Saiva and Vaishnava *dvarapalas,* Kubera, Lakulisa, Garuda and a Jaina Tirthankara. Among the architectural fragments can be seen fragments of *adhishthana* mouldings, *sikhara,* an elephant and head of a *makara.* These remains, on stylistical grounds, can be dated to the thirteenth century.

Apart from the above mentioned Paramara temples the four *bhumija* temples known as Rangamahal inside the fort at Ajaygarh, District Panna, and built by the Chandellas were also surveyed. Dedicated to Siva, the temple 1 consists on plan of a sanctum, an *antarala,* a *sabha-mandapa* and an *ardha-mandapa.* The superstructure of the *sanctum* and the southern wall of the *antarala* has collapsed. The door-jamb of the sanctum has seven *sakhas.* The ceiling of the central hall of the *sabha-mandapa* rests on four elaborately carved pillars. In elevation, the temple shows *pitha* and *adhishthanajangha* and *varandika* mouldings. The *bhadra*-niches on the *jangha* show Narasimha on the east and Andhakantaka Siva on the south. The *sikhara,* which surmounted the *varandika* mouldings, has collapsed but the ruins scattered around the temple, suggest it to be of *bhumija* style. Among the ruins lying around the temple could be noticed miniature shrine-models of the *sikhara* and a seated Nandi.

The second Siva temple 2 consists on plan of a star-shaped sanctum, an *antarala* and a *sabha-mandapa* with three *mukha-mandapas.* The ceiling of the sanctum has collapsed. Its door jamb is embellished with seven *sakhas* and at the door are placed the Saiva *dvara-palas.* Above the doorway are shown five niches containing images of Brahma, Chamunda, Nataraja, Ganesa and Vishnu. The walls of the *antarala* are decorated with a sculptured niche each, while the niche in the northern wall contains an image of seated Brahma-Savitri, the niche in the southern wall is now lying empty. The flat ceiling of the *antarala* was, once decorated with four full-bloomed lotuses of which now only three have survived. The *sabha-mandapa* has three doorways, one each on the northern, southern and western sides, approached by flights of steps. The ceiling of *sabha-mandapa* rests on twelve pillars. The flat ceilings of the *mukha-mandapas* are decorated with full bloomed lotuses. Vertically, the temple has *pitha, adhishthana* mouldings, the *jangha* and the exposed core of *varandika* mouldings and *sikhara.* The roof of the *sabha-mandapa* is missing. Among the debris lying around the temple can be noticed the pilasters of *vedika, sukanasika* carved with circular chaitya-medallion encircling two *ghatas,* fragments of *sikhara* carved with a mesh of *chaitya*-arches, fragments of *samvarana* roof of *sabha-mandapa.*

The Saiva temple 3, on plan, consists of a sanctum and an *antarala.* The ceiling of the sanctum is missing. The door of the sanctum is decorated with seven *sakhas,* the lower portion of which is damaged. The figures of the Saiva *dvarapalas* carved on the sanctum-doorway and an image of Nataraja on the *lalata-bimba* indicate that the temple was dedicated to Siva. On the lower portion of

the northern pillar of the *antarala* is carved the figure of a king standing under an umbrella and on the lower portion of the southern pillar is shown the figure of queen also standing under an umbrella. These figures represent the royal builder of the temple and his wife. The outer portion of the temple has only the exposed core of wall from the bottom to the top. Among the ruins still lying at the site can be noticed fragments of *sikhara, yoni-patta,* Nandi and an image of three-headed and eight-armed Vaikuntha Vishnu standing in *tribhanga.*

Temple 4, also a Siva temple, consists of a sanctum, two-storeyed *antarala* and three-storeyed *sabha-mandapa* with three *mukha-mandapas.* Each of the *mukha-mandapa* is two-storeyed and is approached by a flight of steps. The ceiling of the sanctum is missing. The sanctum-doorway is decorated with eight *sakhas.* The niches on the *lalata-bimba* contains an image of Nataraja. The figures of *Saiva-dvarapalas* are shown on either side of the sanctum-doorway. The flat ceiling of the *antarala* rests on four pilasters. At each of the four comers of the *sabha-mandapa* is a room, the ceiling of which is supported by four pillars. Thus, there are sixteen pillars on the ground floor of the *sabha-mandapa.* The first floor of the *sabha-mandapa* is approached by four staircases located on the southern and northern sides near the *mukha-mandapas.* The other two floors of the *sabha-mandapa* follow the same plan as the ground floor. The ceiling of the central hall of the *sabha-mandapa* is of *nabhichchhanda* variety and rests on four pillars. In elevation the temple shown *pitha* and *adhishthana* mouldings, *jangha* decorated with five pilasters in each of the four quandrants and *varandika* mouldings. The *bhumija sikhara* above the *varandika* mouldings is now missing. The eastern, northern and southern walls of the sanctum are in a dilapidated condition. Among the debris, lying around the temple, can be noticed a circular *chatiya*-medallion of the *sukanasika* containing twc *ghatas,* crowned by a *kirtimukha,* fragments of *kuta-ghantas* of *samvarana,* fragments of *pitha* and *adhishthana* mouldings, miniature shrine-models of *sikhara* and an *amalaka.* This is the most developed and beautiful example of the *bhumija* temples in this fort. It is built of black stone and is assignable to twelfth century AD.

The remains of Brahmanical and Jaina, Paramara temples scattered at Nadner, District Sehore, were also surveyed. Among Brahmanical sculptures mention may be made of Siva, Vishnu, Uma-Mahesvara, *apsarses,* Vaishnavi, Surya, a miniature Saiva-shrine showing seated Siva-Parvati playing *chaupar,* seated Uma-Mahesvara, Ganesa, two images of Parvati performing penance, Lakshmi-Narayana riding Garuda and a lady with a child standing in graceful posture at the half-closed door (pl. LVIII A). Among the Jaina sculptures mention may be made seated and standing Jaina Tirthankaras, Gomeda and Ambika. In the debris could be seen architectural fragment of temple, the *bhuta*-brackets, *amalakas,* carved pillars, pilasters and lintels, door-sills, miniature shrine-models of *sikhara,* fragments of *adhishthana* mouldings, door-jambs, capitals of pillars, and a ceiling stone-slab carved with a full-blown lotus.

At Pipaliya Lorka, District Raisen, on the bank of a tank are the plinth of a Siva Temple of the Paramaras assignable to tenth century. Architectural members such as the stone-slab carved with full-blown lotus, fragmentary *adhishthana* mouldings and a *yonipatta* are lying among the debris. On a platform, known as Patel-baba-ka chabutara, are lying fragmentary sculptures of Ganesa and fragment of a pillar carved with chess-board design. On the site of a modern temple of Dakshinesvara

Hanuman originally stood another Siva temple, some of the remains of which are now kept on the platform of the present temple, the important among them are sculptures of Siva-Parvati, Parvati, dancing Ganesa, seated Nandi and a *yoni-patta* and door-jambs.

The Siva temple, locally known as Bada Mahadeva Mandira at Pachor, District Rajgarh, has on plan, a *pancharatha* sanctum, an *antarala* and a *sabha-mandapa.* Only the sanctum and the *antarala* are part of the original temple, the *sabha-mandapa* has been completely renovated. The sanctum enshrines a Siva-*linga* on a circular *yoni-patta.* The flat ceilings of the sanctum and *antarala* are decorated each with a full-blown lotus. The original portion of the sanctum door has four *sakhas.* The portion above the *pitha* mouldings has been completely renovated. The *jangha* is plain and is divided into two compartments by a median band. Above the *jangha* rests the *sikhara* which is decorated with *karana* and *urah-sringas* and is surmounted by *amalaka, kalasa* and *bijapuraka.* Among the sculp tural remains of the temple still seen at the site, can be seen the sculptures of Uma-Mahesvara, Ganesa, Nandi, *yoni-patta,* Siva-*linga,* fragment of *dasavatara* image of Vishnu and Yoga-Narayana. The temple can be assigned to the tenth century AD.

Sarangpur, in District Rajgarh, has nearly seven Paramara temples of the eleventh-twelfth centuries, only the plinths of which have survived. One of these temples, built of purple sandstone, is located on a mound called on Gandhi-ka-Tila. The plinth of this temple is 48 cm in height. Among the architectural components still lying at the site could be noticed a pilaster carved with a niche containing a diamond design, foliage and bands of diamonds and rosettes and *chatiya*-arches and a bracket carved with two flying *bhutas.* Some of the material of this temple including sculpture, such as Uma-Mahesvara seated in *lalitasana* on the standing mount bull, three stone slabs, one of which with the carving of a frieze of *tamalapatras* inside festoons, second showing a frieze of diamonds and rosettes and the third is decorated with a frieze of *kirtimukhas,* have been reused in a modern Siva temple built to the east of this temple. The modern Deva Kua Mahadeva temple has been built over the remains of a Paramara temple. The remains of the old temple, such as doorsill, *chandrasila,* a standing *surasundari* and a seated Nandi have been reused in the construction of this modem Siva temple.

The architectural and sculptural remains of the other Siva temples of the Paramaras at Sarangpur have stored in the sculpture shed at the site. They include the images of Uma-Mahesvara, three-headed Mahesamurti, Siva seated in *lalitasana,* seated Brahmi, dancing Vaishnavi, seated Nandi figures and door-jambs showing standing Saiva-*dvara-palas.*

The other Paramara sculptures from this place include the images of standing Vishnu, fragmentary *dasavatara* Vishnu images, bust of an image of three-headed Vaikuntha Vishnu, head of Vishnu, Surya seated in *ardhaparyankasana* inside a chariot drawn by three horses, and seated and standing images of Kubera, and the Jaina images of Ambika, *chatushtika* showing a seated Jaina Tirthankara on each of the four faces and a number of heads of the Jaina Tirthankaras, which are stored in the sculpture-shed at the site. A fine image of Amibka seated in *lalitasana* and carrying mango-bunch and child is fixed on the western wall of the sanctum of Tilabhandesvara temple at Sarangpur.

There are two temples, of Paramara period, at Dharampuri, District Dhar. One of them is a Vishnu temple, located in Khujawa locality. This temple was later on converted into a Bhavani temple

housing an image of *Simhavahini* Durga in the sanctum. The temple faces north and consists on plan of a *pancharatha* sanctum, a *sabha-mandapa* and an *ardha-mandapa.* The flat ceiling of the sanctum is decorated with a full-blown lotus in the centre and with *kirtimukhas* on each of the four corners. The original sanctum-doorway is missing. The *sabha-mandapa* has a central hall, the ceiling of which rests on four pillars decorated on the lower portion of the shaft with bearded ascetics and *surasundaris.* The ceiling of the central hall of *sabha-mandapa* is decorated in the centre with a full-blown lotus inside a square and with a *kirtimukha* on each of the four corners. There is a gallery around the central hall of *sabha-mandapa.* The walls of the *sabha-mandapa* are decorated with images of Yoga-Narayana and Kalki riding a horse. The *ardha-mandapa* has collapsed and disappeared. In elevation the temple shows *pitha, adhishthana* and *jangha* of which only the *pitha* and *adhishthana* mouldings are original. On the eastern wall of the *sabha-mandapa* is carved an image of a bearded male warrior standing in *tribhanga* and holding a bow in his left hand. Both of his hands have been chopped off. the image is locally known as that of Dronacharya. The sculptures of the original Vishnu temple are lying on the eastern side of the temple and include those of bearded male ascetics, Vishnu, Varaha, *dasavatara* Vishnu and Parvati practising penance.

On the east of the Bhavani Temple near the river bank, stands on a platform a miniature shrine of Garudasina Vishnu. Vishnu is eight-armed but all his hands are now missing. He wears *kiritamukuta, kundalas* and a *dhoti.* On the north of the shrine, on another platform, is fixed an image of eight-armed Narasimha killing the demon Hiranyakashipu (pl.LVIII B). All his hands, except three on the left, are missing. On another platform is seen a large image of eight-armed Vishnu seated in *lalitasana* on a full-blown lotus. All his hands except the lower left, holding a *sankha,* are missing. There is a canopy of serpent-hoods over his head. These sculptures of Vishnu are assignable to eleventh century. A *chatushtika* carved on each of the four faces with an image of flying Garuda in *anjali-mudra* and two fragmentary pillars belonging to the Paramara temple are kept in a modern temple of Hanuman near Bhavani temple.

The Jalesvara Mahadeva temple located at Khujawa, is built over the site of an ancient Paramara temple, the remains of which are still lying in and around the temple. Among the ruins could be noticed images of Parvati practising penance, *kirtimukha* in bold relief, Ganesa and mutilated Nandi.

The Bilvamritesvara Mahadeva temple is located on the western part of the Betor island near Dharampuri. This temple is dedicated to Siva and was built during the Paramara reign in eleventh century. Only the *pitha* and *adhishthana* mouldings of the sanctum and *antarala* and the *pitha* mouldings of *sabha-mandapa* of the original temple, have survived. The sanctum houses a Siva-*linga* and *yonipitha.* The walls of the sanctum above the *adhishthana* are modern. The ceiling of the sanctum is of *nabhichchhanda* variety and is decorated on the top with full-blown lotus. The sanctum door-way is decorated with five *sakhas.* On the *lalata-bimba* are shown two images of Ganesa and the other of Parvati. The portion of the wall above the sanctum-doorway is decorated with five *chaitya*-arches. The *antarala* has two niches, one in the northern and the other in the southern wall. The image of Ganesa in the niches are modern. Above the *pitha* portions of the original *sabha-mandapa,* the superstructure was built in the seventeenth century during Maratha rule. The sanctum is *pancha-ratha* on plan. In elevation the temple shows *pitha* and *adhishthana* moulding, *jangha,*

varandika and *sikhara.* The original *jangha, varandika* and *sikhara* have collapsed and were rebuilt during the Maratha period as is evident from the architectural style. The *Nandi-mandapa,* housing the seated Nandi, in front of the *sabha-mandapa* seems to be a later addition.

The Bilvamritesvara temple is of *panchayatana* variety. There is a shrine on each of its four corners which consists on plan of a sanctum and a *mandapa.* Each of these four shrines is dedicated to Siva and contains a Siva-*linga* installed on a *yoni-patta.* Among the important sculptural and architectural pieces of the temple, mention may be made of an image of an ascetic standing in *tribhanga,* a circular *chatiya*-medallion of the *sukanasa,* a *kinimukha* and a stone lintel carved with typical *chaitya* arches of the Paramara period.

Chakhalda, near Badwani, in district Khargone has also a Siva temple of the Paramara period, datable to the twelfth century. This temple is located on the site of the present Narmadesvara Mahadeva temple on the bank of the Narmada. The present temple is assignable to seventeenth century. The sculptures of the original Paramara temple are kept on a platform near this temple. These sculptures include bust of Siva wearing *jata-mukuta,* seated Ganesa, Uma-Mahesvara and standing Vishnu.

Bajhar, a small village in Tehsil Sendhwa of District Khargone, has yielded ruins of Brahmanical and Jaina temples of the Paramara period assignable to the eleventh century. Notable among the Brahmanical temples is a Siva temple of *panchayatana* variety. This temple is located near a modern Hunuman temple on the bank of *nala.* The central and the subsidiary shrines are dedicated to Siva. The *sahasramukha* Siva-*linga* which was once enshrined in the central shrine, is still lying at the site. However only the plinth of the main shrine as well as of two subsidiary shrines, one on the north-east and the other on the north-west have survived. The plinth of the main shrine is partly covered with debris. Each of the subsidiary shrines on the north-east and north-west consists on plan, of a sanctum, an *antarala* and a *mandapa.* The doorsill of the sanctum-doorways of each of these shrines shows a *mandaraka* in the centre flanked on either side by a *kinimukha.* There is a *chandrasila* in front of the doorsill of both of these shrines.

Bajhar has also yielded architectural and sculptural remains of Sakta, Vaishnava and Jaina temples besides those of Siva temples. These remains have been stacked in an open air museum at the site. The sculptural remains of the Siva temple comprise images of seated and dancing Ganesa, Uma-Mahesvara, Siva-Parvati, Vinadhara Siva, seated Siva, Nataraja and Bhairava. Among the important Sakta image are the seated Brahmi, Mahesvari, Kaumari, Vaishnavi, Varahi and dancing Chamunda and Parvati practising penance. The Vaishnava images show those of standing and seated Vishnu, Lakshmi-Narayana seated on Garuda, Varaha in zoomorphic and anthropomorphic forms and standing Vamana. Besides these, the images of Brahma, Surya, *navagrahas,* Kubera and *sura-sundaris* are also kept in the collection.

Among the sculptural ruins of Jaina temples at Bajhar noteworthy are the images of Tirthankaras, *yakshas* and *yakshis.*

The architectural ruins of the temples at Bajhar comprise fragments of pillars, lintels and *kakshasanas.* The architectural and sculptural styles of ruins of temples at Bajhar bear close resem-

blance with the architectural and sculptural styles of the Paramara temples at Un which were built in the eleventh century AD.

The Vishnu temple at Susari in Tehsil Kukshi, District Dhar, was also surveyed. This *pancharatha* temple on plan consists of a sanctum, an *antarala, sabha-mandapa* and an *ardha-mandapa.* It is a *nirandhara-prasada* and is in a ruined state. Out of the various components of the temple, only the *pitha* and *adhishthana* mouldings of the sanctum, a portion of the *jangha* and *varandika* mouldings, the sanctum-doorway and the walls and ceiling of *antarala* have survived. The *sabha-mandapa* and *ardha-mandapa* have collapsed and their ruins are lying at the site. The walls and the ceiling of the sanctum which is square in plan, have collapsed. The stone slab of the ceiling, still lying at the site, is decorated with a full-blown lotus. The sanctum-doorway is decorated with seven *sakhas* and its lintel shows on its *lalata-bimba* a niche containing an image of four-armed Ganesa seated in *lalitasana* embracing his consort Siddhi. The upper portion of the sanctum doorway is decorated with five projecting niches and six recesses containing images of dancing *apsarases* and seated Vishnu. Above the central niche is carved an image of two-armed flying Garuda. The lower portions of the *dvara-sakhas* are decorated with sculptures of river goddesses, Ganga and Yamuna, male and female attendants and Kubera. The ceiling of the *antarala* is of *nabhichchhanda* variety each carved with *kola* and *gajatalu* courses. In elevation the temple shows *pitha, adhishthana, jangha* and *varandika.* Among the piled up architectural ruins of the temple within the complex can be noticed fragments of *sikhara,* miniature shrine-models of the *sikhara,* bases, shafts, capitals and brackets of pillars, fragments of *nabhichchhanda* ceiling, a circular *chaitya* medallion of *sukanasa* containing scene of *Gajendramoksha,* fragments of *kakshasana,* a ceiling stone slab carved with a full-blown lotus and a *kalasa.* The sculptural ruins comprise images of *surasundaris,* devis and flying *bhutas.*

In addition, the temples of Chhindaka Nagas of Chakrakot at Bhairamgarh, Dantewada and Barsur, all in District Bastar, were also surveyed. Bhairamgarh has four temples of eleventh century AD. One of them is a Bhairava temple while the other three temples do not have any image inside the sanctum. All the temples are located inside the fort area. The Bhairava temple faces south and is an oblong *mandapa* having a roof of tiles supported by wooden beams. This *mandapa* is a modern construction on the site of ancient temple of eleventh century. Inside the *mandapa* is a rock-boulder on which is carved the image of nude four-armed dancing Bhairava, whose head, hands and legs are now lost. He holds a *gada* in his upper left hand. He wears a headdress of serpent-hoods, *sarpa-kundalas, sarpa-vaikakshyaka, sarpa-mekhala* and *mundamala.* Among the loose sculptures kept near the image noteworthy are those of Siva and Brahma. To the west of the temple are kept the image of four-armed standing Bhairava and of a king standing under a royal umbrella.

One of the remaining three temples consists on plan of a sanctum and a *sabha-mandapa* with lateral transepts while the second temple on eastern side has two sanctums or shrines. The ceiling of *sabha-mandapa* of the first temple is supported by three rows of two pillars and pilasters. On the *lalata-bimba* is carved a diamond. The lintels of the temple are still lying at the site among the other ruins.

Only the *pitha* and the *adhishthana* mouldings of the fourth temple at Bhairamgarh have survived. This temple originally consists of a sanctum, a *sabha-mandapa* with lateral transepts and

an *ardha-ntandapa.* The *pitha* mouldings consist of plain *bhitta, kapota, karnika* and *kapota.* Among the scattered architectural ruins of the temple mention may be made of *adhishthana,* pillars and slabs of the ceiling.

The temple of Dantesvari Devi at Dantewada, district Bastar, was also surveyed. The original temple of Dantesvari Devi was built by the Kakatiya ruler Prataparudra Deva or his younger brother Annamadeva in the beginning of the fourteenth century AD. On plan, the present temple consists of sanctum, an *antarala,* two *sabha-mandapas,* a *mandapa* and an oblong *ardha-mandapa.* The ceilings of the sanctum and both the *sabha-mandapas* are flat. It is a *nirandhara prasada.* The ceiling of the *sabha-mandapas* rest on pillars. The *ardha-mandapa* has a roof of terracotta tiles. In the open courtyard of the temple is a *garuda-stambha.* The *mandapa* has three shrines of which the main one is dedicated to Bhairava. The other two shrines have each a Siva-*linga.* This *mandapa* is also known as the Bhairava *mandapa.* Inside the *sabha-mandapa* attached to the *Bhairava-mandapa* are fixed two slabs of an inscription of king Dikpaladeva, a descedant of the Kakatiyas of Warangal who paid a visit to the temple in AD 1703. The main sanctum enshrines an image of six-armed Mahishamardini, made of black stone. Inside both the *sabha-mandapas* of the temple are kept a number of sculptures of black stone. These sculptures have the influence of the contemporary south India sculptures specially the Chola and Kakatiya sculpture. These include standing *dvarapalas,* dancing Siva, seated Ganesa, Nandi, dancing Bhairava, standing Vishnu and Gaja-Lakshmi.

The exterior façade of the sanctum of Dantesvari temple is divided into compartments by a plain median band. The roof of the sanctum consists of nine horizontal tiers or *pidhas* and is crowned by *kalasa* and *bijapuraka.* The roof of the both the *sabha-mandapas* and the *mandapa* are flat. The temple faces east and is under worship.

The Bhairava temple at Dantewada is located at a distance of one kilometre to the west of the Dantesvari temple. After the collapse of the original Kakatiya temple, a new temple of bricks and terracotta tiles has been constructed in the recent past. The main image inside the temple is that of four-armed Bhairava seated in *padmasana* and carrying dagger, *damaru, trisula* and *kapala.* Among the other images found at the site could be noticed those of seated *dvarapalas,* standing and dancing Bhairava and Siva-*lingas.* A stone slab, carved with a *yoni-patta* and Siva-*linga* in the centre and with sculptures of Surya, Karttikeya, Bhairava, Parvati and Ganesa shown on the periphery, is very interesting.

The Mama-Bhanja temple at Barsur, district Bastar, built during the reign of Chhindaka Naga in the eleventh century consists on plan of a *pancharatha* sanctum and an *antarala.* In elevation, the temple shows *pitha* and *adhishthana* mouldings, *jangha, varandika* and *pancharatha nagara sikhara.* The *jangha* is divided into two compartments by a median band of lotus-scrolls, and is decorated with a niche on the *karna-rathas* and *bhadras* on each of the two rows and with *ratnakutas* on the *anu-rathas.* The recesses of the *jangha* are decorated with rectangular pilasters. All the niches of the *jangha* are now empty. Inside the sanctum are kept the images of Ganesa and Narasimha. The ceiling of the sanctum is decorated with a full-blown lotus. The sanctum-doorway is decorated with three *sakhas.* The *lalatabimba* shows an image of two-armed seated Ganesa.

ARCHITECTURAL SURVEY

The Paidamma temple, belonging to the same period as that of the Mama-Bhanja temple at Barsur is a Devi temple and consists on plan of a *pancha-ratha* sanctum, an *antarala* and a closed *mandapa.* The temple stands on a platform. The flat ceiling of the *mandapa* rests on four plain pillars. The *mandapa* has two lateral latticed windows for admitting light and air. The sanctum-doorway is plain and the *lalata-bimba* shows two-armed seated Ganesa inside a niche. The sanctum enshrines an an image of Mahishamardini made of black stone. In elevation, the temple shows the *adhishthana, jangha* and *varandika* mouldings. The *jangha* is divided into two compartments by a plain median band and is decorated with plain rectangular pilasters. The portion above the *varandika* mouldings has collapsed. Among the ruins of the temple scattered at the site could be noticed bust of a goddess, *kalasa,* a dwarf pillar and fragments *of adhishthana, jangha* and *varandika.* The southern wall of the sanctum has collapsed above the *adhishthana* mouldings. This temple was also built during the reign of Chhindaka Naga dynasty in the eleventh century.

The ruins of temples at Gadha Dhanora near Kesakal, District Bastar, are associated with the Saiva and Vaishnava sects and belong to the sixth century AD. Only the lower portion of the sanctum of Siva temple has survived. The extant height of the walls of the sanctum is 1.20 m. On plan, this temple consists of a sanctum, an *antarala* and a *mandapa* all of which are now collapsed and the debris of which can be seen lying scattered around the edifice. The sanctum enshrines a Siva-*linga,* made of purple sandstone, of which the lower portion is octagonal and the upper portion is circular. The floor of the sanctum is lower than that of the *antarala* and is approached by a flight of three descending steps. The ruins of a Vaishnava temple could be seen on the left bank of the Parvati river inside the forest. Noteworthy among the ruins is a white sandstone image of standing Vishnu with curly hair holding *gada* and *sankha* in his two surviving left hands and an oval halo decorated with curly hair behind his head. Noteworthy among the ruins of another Siva temple is an image of standing Saiva ascetic having *jatajuta* above his head. The image is kept under a tree on the foot of the Garhmari hill.

Some of the temple.of the Kalachuris of Ratanpur were also surveyed. These include temple of Sita Devi at Deorbija and Mahamaya temple at Dhamdha, both in District Durg and Deur temple at Gandai, District Rajnandgaon. The Sita Devi temple at Deorbija consists, on plan, of a *sapta-ratha* sanctum and an *antarala.* It is built of white sandstone masonry and faces east. The temple is dedicated to Siva but the Siva-*linga* inside the sanctum is missing. The ceiling of the sanctum rests on four richly-carved pilasters, one at each corner. The top of the ceiling is carved with a full-blown lotus. Inside the sanctum are kept at present loose sculptures of seated Sarasvati, a Saiva ascetic and a king in *anjali-mudra.* The *antarala* of the temple is attached to the sanctum internally. The sanctum-doorway is decorated with five *sakhas,* on the lower portion of which are shown Ganga and Yamuna in standing position. A niche on the *lalata-bimba* of the lintel contains an image of two-armed Ganesa seated in *lalitasana,* exhibiting *abhayamudra* and carrying *modakapatra.* The niche is flanked on either side by seated Navagrahas. The *antarala* is approached by a flight of five ascending steps on the eastern side. The flat ceiling of the *antarala* is devoid of carving. In elevation, the temple is *sapta-ratha* and shows *pitha, adhishthana, jangha, varandika* and the *sapta-ratha sikhara* crowned by an *amalaka* , *chandrika* and the another small *amalaka.* A niche on the westem *bhadra* of the *pitha*

mouldings contains a beautiful image of eight-armed dancing Ganesa. The *jangha* is divided into two compartments by a median band and is decorated with two rows of sculptures depicting dancing Ganesa, *apsarases, vyalas,* erotic couples, Surya, Siva, Mahishamardini, Kaumari, dancing Bhairava, Nataraja, Hariharahiranyagarbha, Hara-pitamaha, Vaishnavi, Brahmi, male-drummers, warriors, devotees, dancing males, flying *vidyadharas* and *gandharvas.* The temple is assignable to late twelfth or early thirteenth century AD.

The Mahamaya temple at Dhamdha, District Durg, consists of a sanctum, an *antarala* and a *sabha-mandapa.* The ceiling of the *sabha-mandapa* rests on nine pillars. The temple is dedicated to Sakti as it enshrines the images of Mahakali, Mahalakshmi and Mahasarasvati. The temple is enclosed by a high enclosure wall. An inscription engraved on the lintel of the sanctum-doorway gives the date of this temple as Vikrama Samvat 1350 = AD 1293. The present temple has been renovated many a time. In the compound of the temple can be seen the images of Ganesa, Vaishnava and Saiva *dvara-palas* and panels showing dance and music scenes. Among the sculptures fixed on the walls of the gateway and the eastern facade of the enclosure wall can be noticed standing Ganga and Yamuna, Vishnu, Brahma, Saiva *dvara-palas,* fragments of *dasavatara* image of Vishnu showing Matsya, Varaha, Narasimha, Vamana, Hariharahiranyangarbha, Nataraja, male-drummers, Saiva ascetics, *apsarases, vyalas* and friezes of swans. These sculptural and architectural fragments were probably brought from the various Saiva and Vaishnava temples of thirteenth century and have been fixed in the enclosure wall at a later date.

The Siva temple on the bank of the Budha tank at Dhamdha is a Gond monument and can be assigned to the fourteenth century. It consists of a sanctum enshrining a Siva-*linga* and an *antarala.* An image of Ganesa is also kept inside the sanctum. The *antarala* has two niches one of which contains an image of Ganesa and the other an image of Karttikeya seated on a peacock. The ceiling of the sanctum is decorated with a full-blown lotus, but that of the *antarala* has three rosette designs. The sanctum is *pancharatha* on plan and in elevation. In elevation, the temple shows *adhishthana* mouldings, *jangha* divided into two compartments by a median band, *varandika* and partly collapsed *pancha-ratha sikhara.* The temple is built of white sandstone masonry and faces west.

The Deur temple at Gandai, District Rajnandgaon, is dedicated to Siva and consists of a sanctum and an *antarala.* The *antarala* is approached by a flight of six ascending steps from the eastern side towards which the temple faces. The sanctum is *sapta-ratha* on plan and enshrines a Siva-*linga*. The niche in the western wall of the sanctum contains an image of Parvati, standing in *anjali-mudra.* Inside the sanctum are also placed two other images, one of a king, seated in *anjali-mudra* alongwith his two queens and the other of Lakshmi-Narayana, seated on Garuda. The ceiling of the sanctum is of *nabhichchhanda* variety and is decorated with a full-blown lotus. The sanctum-doorway is decorated with five *sakhas.* On the top of the wall of the sanctum-doorway is an interesting frieze showing a bull seated in the centre and being worshipped by seven devotees believed to be Arjuna, Bhima, Dharmaraja, Sahadeva, Nakula, Lonamadevi and Rani Draupadi Devi. The images bear inscriptions labels below them. In elevation, the temple shows *pitha, adhishthana, jangha* divided into two compartments by a median band, *varandika* and *sapta-ratha sikhara* crowned by *amalaka, kalasa* and *bijapuraka.* The additional feature of *sikhara* is that it is decorated with images of lions,

horse-riders, *gandharvas* playing on musical instruments, divine couples, flying *kinnaras,* standing *apsarases,* ascetics seated in *padmasana, mangalakalasas* and *kirtimukhas.* The *narathara* or human frieze of this temple shows various Ramayana and Krishna-///a scenes and amorous couples. The *jangha* of the temple is decorated with two rows of sculptures depicting *vyalas, apsarases,* ascetics, amorous couples, Rama, Balarama, Bhairava, Varaha, Krishna, Narasimha, Hanuman, Mahishamardini and Vishnu. The ceiling of the *antarala* is decorated with three full-blown lotuses. The temple is built of purple sandstone and is assignable to the thirteenth century on stylistic and palaeographic grounds.

Besides these, the Pratihara temple of Siva locally known as Suryamandira at Khilchipur, District Mandsaur, rock-cut Siva,temple of ninth century locally known as Kali Devi temple at Vasavi, District Dhar, Santinatha temple and rock-cut Brahmanical and Jaina sculptures assignable to Chandella period in twelfth century inside the fort at Ajaygarh, District Panna, Vishnu temple locally known as Pathar Matha at Patha near Ajaygarh and assignable to tenth century and Nilakantha temple built by the Chandellas in twelfth century inside the fort at Kalinjar, District Banda, in Uttar Pradesh, were also studied and surveyed.

The Parvati temple assignable to the Gupta period and the Chaturmukha Mahadeva temple belonging to the Pratihara period at Nachna, District Panna, the Siva temple of the Gupta period at Bhumara, District Satna, the sculptures of the Paramaras kept in the Museum at Rajgarh, District Rajgarh, the Pratihara temples known as Chhanihari and Panihari at Machalpur, District Rajgarh, were also studied.

BUILDING SURVEY: In continuation of last year's *(1986-87,* p. 138-140) work, R.D. Trivedi assisted by Sudhir Kumar and.Daljit Singh of the Survey carried out the survey of old buildings of Delhi and Lucknow.

Of the buildings surveyed in Husainabad area of Lucknow (Uttar Pradesh), the notable ones are the Jama Masjid, a number of remains of old buildings and Sheesh Mahal gateway complex. To the south-east of Husainabad mosque is situated an unfinished building constructed of *lakhauri* bricks with prominent pilasters and recesses below the multiple arches. It is said that this unfinished structure is a portion of another Imambara which could not be completed prior to the construction of the Chhota Imambara which is located nearby. To the north of the Chhota Imambara lies the area of Sheesh Mahal which was the palace-complex of the Nawabs of Oudh. In this area, new houses have come up in place of old buildings but the right flank of the gateway of the palace-complex still remains standing in dilapidated condition with its three storeys, the upper storey having a *chhajja* supported on stone brackets surmounted by the remains of a semi-circular roof. The gateway consists of a huge arched opening decorated with plaster work and at the plinth level there are remains of a stone moulding: carved with plain leaf pattern as found in late medieval buildings.

Buildings and architectural remains surveyed in Delhi include Mirza Ghalib's house in Ballimaran in old Delhi and Flagstaff tower on the northern part of the ridge near the university area. The building known as Mirza Ghalib's house facing north is entered through a round arched opening followed by two other round arches with plastered surface which are largely repaired and renovated. Inside, the open courtyard which seems to have contained rooms and verandahs in its original form is occupied by new constructions, but on the back side of the wall in *lakhauri* bricks, is still partly preserved to

give some idea of the building of early nineteenth century. As it appears from the closed or partly closed arched openings visible in the narrow courtyard, the old structure seems to have been appropriated and subdivided in various habitational units in later times. Except giving some idea of old nature of the structure, there remains nothing remarkable for architectural merit worth the name of the house associated with the celebrated poet. The Ridge area near the University of Delhi is associated with various historical events of the First War of Independence in 1857. On the elevated spot of the Ridge, a round structure known as Flagstaff tower is located which was topped by a flagstaff during British days. Based on a stone plinth, it has three openings with closed recessed arches and the upper part decorated with arched design in plaster topped by a massive parapet. Inside, a round staircase leads to the upper storey occupied by a central structure with arched openings which supports a wooden umbrella-like structure with a central pole to serve 5s a flagstaff. The Flagstaff tower marks the place where in 1857 British families took shelter before leaving Delhi and where a great struggle took place between the British and the native Indian forces.

In old Delhi, the old buildings situated beside the S.P. Mukherji Marg near the Delhi Railway Station were visited and a remarkable gateway known as Rang Mahal was also documented. It consists of twin gateways which forms the entrance to a street flanked by old buildings decorated with projected *chhajjas.* The first gateway has a recessed arch within a larger cusped arch. In between the two arches, the space on the upper side is decorated with plastered concave designs. It seems that the gateway and the connected buildings were originally embellished with wall paintings which are no more visible. The structure is constructed with *lakhauri* bricks covered with plaster.

IX. PRESERVATION OF MONUMENTS

MONUMENTS OF NATIONAL IMPORTANCE

AGRA CIRCLE

Uttar Pradesh

1. FORT, AGRA, DISTRICT AGRA.—In continuation of the last year's (*1986-87,* p. 141) work, walls and ceilings of the Sheesh Mahal were replastered with special lime stucco composition and convex glass mirrors refixed in patterns matching the original in the southern side room. Decayed and dead concrete on the roof terrace of Delhi Gate was replaced with fresh concrete.

The fortification wall running from Amar Singh Gate to Delhi Gate was underpinned and replastered wherever necessary. The dislodged veneering, *dab* and qued stones were reset and missing stones and *kanguras* restored (pl. LIX).

2. JAMI MASJID, AGRA, DISTRICT AGRA.—The northwestern minar of the mosque was restored and *chhatri* over it replaced with new one. Dislodged casing stones of black and white marble inlay pieces were refixed.

3. ITIMAD-UD-DAULA'S TOMB, AGRA, DISTRICT AGRA.—The compound wall of the tomb was replastered and underpinned with *lakhauri* bricks and missing inlay pieces on the main entrance restored with new ones on the original pattern (pl. LX).

4. ITWARI KHAN'S MOSQUE, AGRA, DISTRICT AGRA.—The inner and outer surface of the walls of mosque was replastered.

5. RAM BAGH, AGRA, DISTRICT AGRA.—The underground cells were replastered. The openings were provided with angle iron doors.

6. TAJ MAHAL, AGRA, DISTRICT AGRA.—Worn-out and decayed stones of *dasa* veneering and those of steps of the Sidi gate were replaced. Damaged stones of the *chhajja* and flagstones of floor in the north-western quadrangle of the forecourt were replaced. Moulded plaster was done in the ceilings of *dalans* in accordance with the original designs. Rooms in the northern wing of the eastern gate were provided with floor, paved with stones and Mughal pattern doors. The red sandstone *bidi* facing north in the eastern side of main gate was replaced and missing inlay bars restored. Weathered and missing veneering, *dab* and qued stones of western enclosure wall were replaced with new ones matching the original and the joints of the façade stones and those of the *kanguras* were pointed. Repairs to the Fatehpuri mosque were also taken up by resetting the dislodged veneering stones, restoring the missing and decayed stones of the *chhajja* and replacing the main façade with new one

as per the original. Missing inlay pieces of *Janwas* of prayer hall were also restored and the joints of concrete roof filled.

Worn-out and missing carved railings and *muttakas* of southeastern Saheli Burj were restored (pl.LXI). Damaged stones of *dasa* brackets, *chhajja,* pillars of Saheli Burj near Kali Mosque were replaced and the missing stones restored. Dislodged white marble stones of extrados of the main dome were reset and roof concreted and the joints of the main façade were grouted.

7. GROUP OF MONUMENTS, FATEHPUR SIKRI, DISTRICT AGRA.—Exfoliated inlaid red sandstone panels of the Jami mosque were replaced with new ones and the missing inlay pieces of white marble restored. Fallen stone pinnacle and architectural members of the southern dome of the mosque were reset and moss and lichen removed from the dome and kiosk. Decayed stones of the floor of the courtyard were replaced with new ones. Exfoliated stones in the southwestern *dalans* and in eastern central chamber of the Buland Darwaza were also replaced.

Dislodged stones of the plinth of Islam Khan's tomb were reset and the missing stones restored.

Dasa stones of the sweet tank were replaced with new stones. The steps were restored and the joints grouted. Approach roads from Shah Quli Baoli to Langar Khana and to Jodha Bai palace were recarpeted.

Decayed and dead lime concrete floor of the stable was laid with fresh lime cement concrete. The apron below the *chhajja* was also restored.

8. HUMAYUN'S MOSQUE, KACHPURA, DISTRICT AGRA.—The protected area around the mosque was provided with a boundary wall with mild steel railing over it.

9. AKBAR'S TOMB, SIKANDARA, DISTRICT AGRA.—The decayed lime plaster of the outer façade of the main mausoleum was replaced with fresh lime plaster.

10. MARIAM'S TOMB, SIKANDARA, DISTRICT AGRA.—The walls and the *dalans* of the mausoleum were replastered with lime and washed with colour after removing the decayed plaster.

11. TEMPLES AT JAGESHWAR, DISTRICT ALMORA.—The dilapidated and collapsed compound wall was restored and the wire fencing was provided to a height of 0.50 m done over it. The joints of stone slabs of *mahamandapa* of the main temple were filled in with tarplastic compound and the upper surface coated with shali-spray solution. The western worn doors of the Kedarnath and Pusti Devi temples were replaced with new ones. The wooden canopies of both temples were painted with waterproof compound.

12. SUN TEMPLE, KATARMAL, DISTRICT ALMORA.—Bulged and collapsed portions of the southern and western façades were dismantled and restored as per original besides reproducing the mouldings on corner stones.

13. TEMPLE AT LAKHAMANDAL, DISTRICT DEHRADUN.—The worn out wooden rafters were replaced with new ones and the decorated and carved wooden *jhalars* restored as per the original pattern. Decayed flagstones of old Siva temple and *dvarapala* were replaced. A compound wall of dry stone masonry was also provided around the temple.

14. MOSQUE AND SARAI, KHUDAGANJ, DISTRICT FARRUKHABAD.—Bulged stones at the back side of mosque and sarai were reset and underpinned. The open joints were pointed and watertightened.

15. MADANA MOHANA TEMPLE, BRINDABAN, DISTRICT MATHURA.—A part of the retaining wall was restored and replastered with lime.

16. EXCAVATED REMAINS, KANKALI TILA, DISTRICT MATHURA.—Excavated remains were under pinned and pointed.

AURANGABAD CIRCLE

Maharashtra

17. MALLIKARJUNA TEMPLE, GHOTAN, DISTRICT AHMEDNAGAR.—The sunken stone slabs of the courtyard were reset as per original. The eastern compound wall was recess pointed and the top water-tightened. The surroundings were also improved by removing accumulated debris. Accretionary walls on the southern side of the temple were removed and original features exposed. The out-of-plumb portions of walls were dismantled and reset.

18. BIBI-KA-MAQBARA, AURANGABAD, DISTRICT AURANGABAD.—The missing ornamental and floral designs of the main tomb were reproduced in lime plaster as per original. The final coat of shining plaster was given to the minarets. The bases of two small minarets of the main tomb were strengthened with epoxy resin.

19. ROCK-CUT CAVES, AURANGABAD, DISTRICT AURANGABAD.—Missing steps from the foot of the hill to Caves 1 to 5 were provided and damaged parapet restored on either side of the steps.

20. FORT, DAULATABAD, DISTRICT AURANGABAD.—The stepwell near the Kacheri building was desilted and damaged walls reconstructed. The parapet wall was also reconstructed and the surrounding area improved.

The damaged fortification wall and bastions were dismantled and reconstructed and watertightened (pl. LXII). The plastering work of Chand Minar and Amkhas is in progress.

21. ROCK-CUT CAVES, ELLORA, DISTRICT AURANGABAD.—The work of re-erection of the *manastambha* of Cave 32 was completed. The ashlar masonry pillars of different caves were dismantled and

restored in R.C.C. matching with adjacent original pillars. The partly missing portions of the *nandi-mandapa* in Cave 22 were also restored. Concreting was also done of the floor wherever necessary.

22. LAKHUJI JADHAVRAO SAMADHI, SINDKHEDRAJA, DISTRICT BULDHANA.—The displaced stones around the *samadhi* were reset in their proper position in combination mortar and wooden doors were also provided.

23. SION FORT, SION, BOMBAY.—The work of plastering the inner and outer faces of the walls of the Portuguese fort in combination mortar was completed. The decayed wooden beams and rafters of the roof were also replaced.

24. MARKANDA DEO TEMPLE, DISTRICT GADCHIROLI.—Watertightening of the roof of the temple by removing dead plaster, raking out the joints, filling in the cavities and replastering the same in combination mortar was taken up. Provision of plinth protection to various sub-shrines by laying plain cement concrete was completed.

25. PATNADEVI TEMPLE, PATNA TAL, CHALISGAON, DISTRICT JALGAON.—The dilapidated and fallen retaining wall was reconstructed and bed concrete was laid and stone masonry work is in progress.

26. ROCK-CUT CAVES, ELEPHANTA, DISTRICT RAIGAD.—The terrace wall from Cave 2 to 4 was repaired. The damaged base portion of the pillars of the Cave 3 was also repaired.

27. RAIGAD FORT, RAIGAD, DISTRICT RAIGAD.—The dilapidated walls were dismantled and restored. The Gangasagar tank was desilted and repaired.

28. FORT, JANJIRA, DISTRICT RATNAGIRI.—The work of pointing and watertightening of fort wall was done in addition to improving the surrounding areas.

29. FORT, BASSEIN, DISTRICT THANE.—The dilapidated bastion near the gate was restored followed by the parapet wall on top, in combination mortar. The missing stone pavement was also provided. The fortification walls near the gate were underpinned and reconditioned. The inner faces of the walls of Gonsalo-Garcia-Church were recessed-pointed in combination mortar.

BANGALORE CIRCLE

Karnataka

30. FORT AND GATES, BANGALORE, DISTRICT BANGALORE.—The top of the ramparts of the old dungeon were watertightened by laying concrete. The uneven flooring in front of the Ganesha shrine was relaid and pointed. Dead plaster in front of the dungeon was removed and replastered.

31. KALLESVARA TEMPLE, BAGALI, DISTRICT BELLARY.—The bulged and out-of-plumb portions of

the walls of the main and the Suryanarayana shrines were dismantled and reconstructed as per original after strengthening the foundation.

32. EXCAVATED REMAINS, KAMALAPURAM, DISTRICT BELLARY.—The single-faced southern retaining wall of the public bath measuring 77 m in length and with an average width of 1.80 m had become out-of-plumb and had collapsed at places. The listed portion was dismantled and reset as per the original. Similarly, the listed inner retaining wall was also dismantled and reset as per original and the joints were recess-pointed. Rubble, available in abundance in the ruins, was used for laying foundation and core filling. The lion-capitals retrieved from the excavation as also those exhibited in the Site Museum were re-erected in their original position on the pillars in the middle of the southern inner veneering. The moulded architectural members forming the uppermost course of the extant inner retaining wall were set to plumb and granite grass was filled as the uppermost layer of the core with an outward gradient to drain off the rain water.

The walls of the small shallow rectangular pond exposed east of decorated platform had collapsed and the moulded stone basement enclosing the pond was out-of-alignment. The tank was rebuilt and plastered. The sunken moulded courses were dismantled and realigned after providing suitable foundation and the damaged feeder channel on the west was reconditioned.

The walls of the southern doorway of the Hazara Rama temple had become out-of-alignment and bulged due to seepage of rain water into the core. The walls and the door jambs were dismantled and reset to plumb after filling the core with lime and rubble (pl. LXIII). Architectural members retrieved from the accumulated debris were utilized to reset the walls to the original height.

The storage well behind the sanctum of the Hazara Rama temple was cleaned and recess-pointed. The edge of the well was raised upto 0.75 m above the ground level to prevent accumulation of debris. The fallen slabs of the channel feeding the tank were refixed in lime mortar. Similarly, the out-of-plumb rubble walls exposed south of the Hazara Rama temple were dismantled, reset with mud mortar and pointed with finely ground lime mortar. A coat of slush of the local earth was given to the pointed surface to achieve antique appearance.

The collapsed upper course of the stepped well exposed south of the public bath were reset with roughly dressed stones and were recess pointed in the inner lining. Steps were provided in the west which after a landing, turn southwards to reach the water-edge from north.

The upper courses of the side walls of the 'T'-shaped tank which was exposed earlier were out-of-plumb and the pavement slabs were out of alignment. They were removed after due documentation and set to plumb and alignment as per original plan after filling the area in by alternate layers of rubble and earth. Similarly, missing flight of steps on the western side were reconstructed by using bricks of the same size collected from the debris besides recess-pointing the joints of the entire tank. The stone-cut channel connecting the tank and the main acqueduct was repositioned to requisite gradient.

The entrance located on the north-eastern side of the Mahanavami Dibba, providing access to the royal personages into the Royal Enclosure, along with the enclosure wall running parallel to the Mahanavami Dibba, had completely collapsed and at places the foundation had sunk. The elephant-shaped balustrades and the steps were buried under debris. The enclosure wall was reset to a height

of 1.2 m and balustrades were refixed after providing steps. The badly disturbed pavement was relaid and the soakage pit lying on the north-eastern corner was reconditioned. The door-sill of the entrance originally accommodating the carved stone doors was also repositioned.

The western wall of the Royal Enclosure had collapsed at various places and listed at other places. The listed portions were dismantled and the wall was reset to a height of 3 m as per the original plan and width of 2.75 m upto a length of 124 m using the available cyclopean blocks. The core was filled by alternate layer of rubble and earth.

33. PATTABHIRAMA TEMPLE, KAMALAPURAM, DISTRICT BELLARY.—The missing outer veneering slabs of the southern and western *prakara* wall were provided (pl. LXIV). Strengthening the beams of the *mahadvara* by inserting I-section girders to facilitate the removal of the obstructive masonry props is in progress.

34. ZANANA ENCLOSURE, KAMALAPURAM, DISTRICT BELLARY.—The out-of-plumb portion of the enclosure wall near the northern watch-tower was dismantled and reconstructed as per original.

35. KRISHNA TEMPLE, KRISHNAPURAM, DISTRICT BELLARY.—Due to faulty foundation, the exterior veneering wall of the *mahadvara* was unequally settled resulting in damaged or missing architectural members. Certain portions, including the left façade *mandapa* were dismantled and are being reset as per original after strengthening the foundation with a course of boulders and concrete. In this process, the original architectural members obtained from the clearance of debris in front of the *mahadvara* was utilized. The massive masonry props provided to support the broken and overhanging lintels and beams were removed after mending *in situ* the fragments of the former using stainless steel clamps and Araldite and by replacing the broken beams. The missing roof slabs of the central bay of the *mahadvara* were replaced (pl.LXV). Besides, a portion of the out-of-plumb *prakara* was reset and a broken beam in the *maha-mandapa* was strengthened with stainless steel rod.

36. VITTHALA TEMPLE, VENKATAPURAM, DISTRICT BELLARY.—I-section girders were provided to the broken lintels of the eastern and southern entrance of the *navaranga* besides replacing the missing roof-slabs and watertightening the roof (pl. LXVI). Another beam of the *mahadvara* was strengthened by inserting I-section girders. A photograph of the front general view of the temple taken in 1859 shows an intact *dhvajastambha.* Taking this clue, the clearance made around the standing fragment yielded other fragments, mending of the same is in progress. The out-of-plumb *mandapa* to the south east of the *mahadvara* is being dismantled for resetting.

37. BADIGER GUDI, AIHOLE, DISTRICT BIJAPUR.—Missing and damaged stones of the retaining wall and the approach steps of the tank located to the east of the temple were replaced with new stones.

38. LAD KHAN TEMPLE AND GAUDER GUDI, AIHOLE, DISTRICT BIJAPUR.—The houses clustering unaesthetically around the monuments Were acquired and dismantled. Fencing the area and levelling the same for landscape development is in progress.

39. TEMPLE TO THE SOUTH OF DURGA TEMPLE, AIHOLE, DISTRICT BIJAPUR.—A raised flagstone pavement was provided. Replacement of missing slabs and beams of the façade eave is in progress.

40. SANGAMESVARA TEMPLE, BEVOOR, DISTRICT BIJAPUR.—The bulged out portions of the external veneering wall of this *trikutachala* temple were dismantled and reset to plumb. The accretionary concrete of the roof of the common *mandapa* was removed and made watertight with a new layer of concrete. Broken beams of the *mukha-mandapa* was replaced with new beams.

41. ASAR MAHAL, BIJAPUR, DISTRICT BIJAPUR.—Reflooring was done on one of the chambers in the first floor. The compound wall on east and south was dismantled and reconstructed.

42. GOL GUMBAD, BIJAPUR, DISTRICT BIJAPUR.—The vault of the Naqqar Khana housing the reserve collection of the Archaeological Museum was replastered in combination mortar removing the decayed plaster. Missing stones on the exterior of the basement were provided.

43. SHEIKH HAMID QADIRI'S TOMB, BIJAPUR, DISTRICT BIJAPUR.—The undulating pavement of the corridor was repaved in northern and southern sides after levelling the ground. The doors and the windows were repainted.

44. MANDAPA SOUTH OF BANASHANKARI TEMPLE, CHOLACHAGUDA.-DISTRICT BIJAPUR.—The collapsed portion of the *mandapa* was dismantled and reset as per original and the roof was rendered watertight (pl. LXVII).

45. NAGANATHA TEMPLE, NAGARAL, DISTRICT BIJAPUR.—The out-of-plumb exterior wall of the *garbhagriha* portions of the *sikhara* and the wall of the *mandapa* were dismantled and reset as per original.

46. GROUP OF MONUMENTS, PATTADAKAL, DISTRICT BIJAPUR.—Fencing the recently acquired area beyond the Kadasiddhesvara temple is underway.

47. AMRUTESVARA TEMPLE, AMRUTAPURA, DISTRICT CHICKMAGALUR.—The *bhitti* portion of the Sarada shrine was reconstructed using available and new stones upto roof level. The dismantled *prakara* was reconstructed on the eastern side after strengthening of the foundation.

48. MUKTESVARA TEMPLE, CHAUDADANAPURA, DISTRICT DHARWAR.—The missing veneer of the *bhitti* of the sub-shrine was provided.

49. MUSKIN BHAVI, LAKKUNDI, DISTRICT DHARWAR.—The bulged revetment wall of this well, on the north-eastern and north-western corners, were dismantled and reconstructed as per original. The niches were reset in their proper location.

50. HOYSALESVARA TEMPLE, HALEBID, DISTRICT HASSAN.—Grill of mild steel was fixed over the compound wall, constructed around the newly-acquired area.

51. FORT AND DUNGEON, MANJARABAD, DISTRICT HASSAN.—The rank vegetation covering the curtain walls and battlements was removed. The resetting of steps leading to the gateway is in progress.

52. PANCHAKUTA BASADI, KAMBADAHALLI, DISTRICT MANDYA.—The reconstruction of dismantled Neminatha *basadi* as per original was completed.

53. NARAYANASVAMI TEMPLE, MELKOTE, DISTRICT MANDYA.—The replastering of *hara* with *koshthas* was done after raking out the dead plaster. The mending of stucco figures in the *koshthas* and the *gopura* of the *mahadvara* was attended.

54. NAMBINARAYANA TEMPLE, TONNUR, DISTRICT MANDYA.—The unevenly sunken flooring of the inner and outer *prakara* was relaid over a sand-bedding with new stones wherever necessary. The *mahamandapa* flooring was relaid in stone instead of the old concrete one. On the southern side of the *prakara* the parapet was replastered in combination mortar.

55. SRIKANTESVARA TEMPLE, NANJANGUD, DISTRICT MYSORE.—New teak-wood doors of matching pattern were provided.

56. VAIDYESVARA TEMPLE, TALKAD, DISTRICT MYSORE.—A revetment wall of ashlar masonry was constructed on the western side to arrest the transient sand-dune. A drain was provided to prevent rain-water clogging the courtyard. On the south-east corner, stone pavements were provided.

57. MADHUKESVARA TEMPLE, BANAVASI, DISTRICT NORTH KANARA.—Flagstone paving was done around the temple to prevent seepage of water into the foundation.

58. RENUKAMBA TEMPLE, CHANDRAGUTTI, DISTRICT SHIMOGA.—The fallen portion of the façade and retaining wall was reconstructed as per original. Flagstone pavement was done on both the sides of the shrine.

59. RAMESVARA TEMPLE, KELADI, DISTRICT SHIMOGA.—The laterite walls of *chandrasala* and the granary were plastered. The out-of-plumb walls on the western cloister were dismantled and reconstructed as per original. The accumulated debris of earth was removed from the top of the wooden ceiling.

60. KAITABHESVARA TEMPLE, KOTIPURA, DISTRICT SHIMOGA.—The debris on the eastern, northern and southern sides of the temple was removed and the ground levelled. The roof-slab joints were pointed with epoxy resin (Araldite) to prevent leaks.

61. CHOWTER'S PALACE, MUDABIDRI, DISTRICT SOUTH KANARA.—A masonry wall of laterite blocks, with granite lintels over the doorway, was constructed to support the tiled roof. Fresh wooden rafters were provided.

BHOPAL CIRCLE

Madhya Pradesh

62. FORT, LANJI, DISTRICT BALAGHAT.—In continuation of last year's (*1986-87,* p. 144) work, the restoration of collapsed portion of the fort wall was taken up and is in progress.

63. KAMLAPATI PALACE, BHOPAL, DISTRICT BHOPAL.—In continuation of last year's (*1986-87,* p. 145) work, the old damaged and decayed wooden door frames and shutters were replaced with fresh teak wood door frames with shutters. The work is in progress.

64. CHOPRA TANK, KHAJURAHO, DISTRICT CHHATARPUR.—The work of replacement of the old low-lying barbed-wire fencing on stone posts around Chopra tank with high level barbed-wire fencing on angle iron posts and restoration of parapet wall of tank is in progress.

65. GHANTAI TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR.—Replacement of the old damaged low-lying barbed-wire fencing on stone posts with high level G.I. barbed-wire fencing on angle iron posts and lime concreting of approach path and apron to check the cutting of path and ingress of rain water is in progress.

66. KAKRAMATH, KHAJURAHO, DISTRICT CHHATARPUR.—Restoration of old damaged retaining wall and fencing the area is in progress.

67. LALGUAN MAHADEVA TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR.—Restoration of damaged and missing stones of the floor of the platform and fencing of the area is in progress.

68. MATANGESVARA TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR.—In continuation of last year's work (*1986-87,* p. 145) the lime concreting of approach road to Matangesvara temple and the open-air collection was completed.

69. OLD TEMPLE, KODAL, DISTRICT DAMOH.—In continuation of last year's work (*1986-87,* p. 145) the restoration of C.R. masonry compound wall on old traces in lime mortar mounted with G.I. barbed wire fencing on angle iron posts was completed and the temple shrine watertightened.

70. BEERSINGH PALACE, DATIA, DISTRICT DATIA.—In continuation of last year's work (*1986-37,* p. 145), the deteriorated roof concrete was dismantled and relaid with fresh lime concrete to make the terrace watertight. The area has been fenced to check encroachments.

71. ROCK-CUT CAVES, BAGH, DISTRICT DHAR.—In continuation of last year's work (*1986-87,* p. 145), four R.C.C. pillars, two in the eastern side and two in the central hall of the Cave 4 were built in core only, replacing the old deteriorated and damaged rock-cut pillars in addition to ten pillars which have already been constructed and finished with rock toning in lime *surkhi* mortar, matching the original after dismantling the weathered and damaged pillars. Similarly, R.C.C. beams and slab were also been constructed after replacing the damaged rock-cut ones and finished with rock toning in lime *surkhi* mortar. The air gap between R.C.C. slab and the concave ceiling was filled with empty inverted earthen pitchers as done earlier to avoid impact of falling chunks. Cement concrete was laid on the roof of Caves 4, 5 and 6 to make it watertight followed by a layer of lime concrete. The holes drilled by M.E.C.L. for rock bolting from the top were sealed with cement concrete after placing steel rod and filling cement sllury in the holes. The work is in progress.

72. JAHAZ MAHAL, MANDU, DISTRICT DHAR.—In continuation of last year's work (*1986-87,* p. 145) the entire pathway and drains were provided with fine chisel-dressed red limestone flooring on lime concrete base. The dilapidated passage was restored by providing fresh chiselled limestone slabs near the upper tank. The missing stones of the steps leading to the upper storey of the monument were provided with fresh limestone slabs. Teak wood railing has been provided on the flight of the steps for the safety of visitors.

73. KAPOOR TALAV, MANDU, DISTRICT DHAR.—In continuation of last year's work (1986-87, p. 145), the damaged and missing upper stone courses of the retaining wall of the tank have been restored with R.R. stone masonry in lime *surkhi* mortar. The settled debris mixed with heavy boulders and rubbish inside the tank, along with enclosure wall have been excavated and removed.

74. SOMAVATI KUND, MANDU, DISTRICT DHAR.—In continuation of last year's work (*1986-87,* pp. 145-146), the bulged and damaged northern enclosure wall of the tank has been restored with *urdia* stone ashlar masonry. The silt of the tank has been removed and the pathway leading to Darya Khan's tomb provided with random rubble masonry. The work is in progress.

75. TAVELI MAHAL, MANDU, DISTRICT DHAR.—Restoration of damaged and missing *chhajjas of* the ground floor was taken up with fresh fine chisel-dressed limestone and the old railings of flight of steps and first floor replaced with fine chisel-dressed limestone railings. The work in in progress.

76. THEATRE HALL IN ROYAL COMPLEX, MANDU, DISTRICT DHAR.—The cracked arches and damaged wall were repaired and dumped debris removed.

77. AHUKHANA, BURHANPUR, DISTRICT EAST NIMAR.—In continuation of last year's work (*1986-87,* p. 147), the damaged and missing portions of compound wall have been restored.

78. RAJA-KI-CHHATRI, BURHANPUR, DISTRICT EAST NIMAR.—The damaged and missing flagstone

flooring was restored with fresh flag stones and the protected area fenced with G.I. barbed wire on angle iron posts to check the encroachment.

79. CHAND SURAJ GATEWAY, MANDHATA, DISTRICT EAST NIMAR.—The damaged and missing stone flooring was restored and area fenced with G.I. barbed wire on angle iron posts to check encroachments.

80. DELHI GATE, CHANDERI, DISTRICT GUNA.—Deteriorated, damaged, and missing portions of Delhi gate, *kanguras* and adjoining wall were restored in C.R. stone masonry, matching the original. The work is in progress.

81. FORT, CHANDERI, DISTRICT GUNA.—The debris of fallen portions of the palaces, west of Naukhanda was removed and the damaged and missing walls restored in C.R. stone masonry. The work is in progress.

82. KHIRKI GATE, CHANDERI, DISTRICT GUNA.—In continuation of last year's work (*1986-87,* p. 146), the deteriorated, damaged and missing portions of Khirki gate and adjoining wall were restored in C.R. stone masonry on original traces and the roof made watertight.

83. KOSHAK MAHAL, CHANDERI, DISTRICT GUNA.—In continuation of last year's work (*1986-87,* p. 146), the missing veneer stones from the façade were provided with fine chisel dressed ashlar stones matching the original. The missing flagstone flooring at the first floor was provided with fresh chisel dressed flagstones.

84. SHAHZADI-KA-RAUZA, CHANDERI, DISTRICT GUNA.—The missing flagstone flooring was provided with fresh chisel-dressed flagstone.

85. SINGHPUR PALACE, CHANDERI, DISTRICT GUNA.—In continuation of last year's work (*1986-87,* p. 146), the replacement of flagstone flooring of display galleries with polished Kota stone was completed.

86. ASSI KHAMBA, FORT, GWALIOR, DISTRICT GWALIOR.—In continuation of last year's work (*1986-87,* p. 146), the compound wall was lowered and pillared hall treated with ammonia wash to give original look. The work is in progress.

87. FORT, GWALIOR, DISTRICT GWALIOR.—In continuation of last year's work (*1986-87,* p. 146), the rooms of hospital and jail buildings were plastered and washed with oil bound distemper. Window and ventilator openings were provided with M.S. grill and glazed shutters. The flagstone flooring of display rooms was replaced with cement concrete floor. The compound was enclosed by providing dwarf wall mounted with M.S. grill. The work is in progress.

88. HATHI POLE GATE, FORT, GWALIOR, DISTRICT GWALIOR.—In continuation of last year's work (*1986-87,* p. 146), the rooms over the gate were treated with ammonia wash to afford original look. The work is in progress.

89. MANSINGH PALACE, FORT, GWALIOR, DISTRICT GWALIOR.—In continuation of last year's work (*1986-87,* p. 146), the chiselling of mother rock for the foundation of retaining wall of the Bastion 3 and replacement of old decayed and damaged roof concrete with fresh lime concrete to make the roof terrace watertight is in progress.

90. ROCK-CUT JAINA COLLOSI (EK-PATHAR-KI-BAOLI), GWALIOR, DISTRICT GWALIOR.—The damaged and missing portion of the compound wall has been restored in C.R. stone masonry to check the encroachment. The work is in progress.

91. TELI-KA-MANDIR, FORT, GWALIOR, DISTRICT GWALIOR.—In continuation of last year's work (*1986-87,* p. 147), the damaged and missing portions of compound wall were restored in R.R. stone masonry to check trespass.

92. CHAUSATH YOGINI TEMPLE, BHERAGHAT, DISTRICT JABALPUR.—In continuation of last year's work (*1986-87,* p. 147), the work of restoration of masonry pedestals of Yoginis, stone pitching of pathway and watertightening of roof terrace is in progress.

93. VISHNU-VARAHA TEMPLE, KARITALAI, DISTRICT JABALPUR.—In continuation of last year's work (*1986-87,* p. 147), the accumulated debris has been removed and area levelled. The tank (*kunda*) was restored with stone masonry.

94. JAINA IMAGES, FORT, AJAIGARH, DISTRICT PANNA.—Restoration of cell of Jaina images in C.R. stone masonry was taken up and the work is in progress.

95. PARVATI TEMPLE, NACHNA, DISTRICT PANNA.—In continuation of last year's work (*1986-87,* p. 147), the bulged portions of plinth of the platform were reconstructed in ashlar stone masonry in plumb. The platform was paved with cut stone flooring.

96. BUDDHIST MONUMENTS, SANCHI, DISTRICT RAISEN.—In continuation of last year's work (*1986-87,* p. 148), the paving of approach path to Stupa 1 and 3 and the old museum building with flagstones was completed.

97. TOMB OF BALJIT SINGH SHAH, DHAMONI, DISTRICT SAGAR.—In continuation of last year's work (*1986-87,* p. 148), the damaged and out-of-plumb platform was restored in ashlar stone masonry. Floor concrete was replaced with fresh lime concrete.

98. NAGINA MAHAL, KHIMLASA, DISTRICT SAGAR.—Broken door lintel was replaced with fresh stone door lintel and concreted.

99. MALADEVI TEMPLE, GYARASPUR, DISTRICT VIDISHA.—The work of restoration of damaged and missing cut stone flooring and providing flight of approach steps is in progress.

BHUBANESWAR CIRCLE

Madhya Pradesh

100. MAHADEVA TEMPLE, BASTAR, DISTRICT BASTAR.—The fencing work around the temple was nearing completion.

101. VISHNU TEMPLE, JANJGIR, DISTRICT BILASPUR.—The missing compound wall was constructed and the *sikhara* watertightened.

102. BHAND DEUL (JAINA TEMPLE), ARANG, DISTRICT RAIPUR.—Stone apron was provided to the southern and western sides of the temple and the whole complex has been beautified by levelling and raising of garden all around.

103. SITADEVI TEMPLE, DEORBIJA, DISTRICT RAIPUR.—The floor of the temple-complex was provided with stone paving to stop seepage of water into the foundation. Stone apron was also provided all around the *Sati*-pillar for the convenience of the visitors for performing *pradakshina* alround.

Orissa

104. BHUBANESVARA MAHADEVA TEMPLE, BHAVANIPUR, DISTRICT CUTTACK.—The collapsed compound wall was restored with laterite masonry. The accumulated earth deposit was removed and foundation strengthened and watertightened. The missing members were restored by new carved stones and the entire area around the temple is being provided with barbed wire fencing on angle iron posts with ornamental gates at the entrance.

105. BUDDHIST STUPA, LALITAGIRI, DISTRICT CUTTACK.—The restoration of the first drum of the exposed stupa upto a height of two metres was completed by dressed khondalite stones. The work on the second drum is in progress.

106. MONASTERY COMPLEX, UDAYAGIRI, DISTRICT CUTTACK.—Restoration work of the excavated monastic complex was taken up. The missing eastern side wall was reconstructed as per the original and the sanctum restored upto a height of two and half metres from the ground level with the help of dressed old bricks. The work is in progress.

107. DAKSHA PRAJAPATI TEMPLE, BANPUR, DISTRICT PURI.—After the deplastering of the *jagamohana,* the missing architectural members of the terraced roof was taken up. The work is in progress.

108. BAKRESVARA TEMPLE, BHUBANESWAR, DISTRICT PURI.—The worn-out barbed wire fencing was replaced by a lateritc masonry compound wall of two metre-height all around to restrict misuse and encroachments.

109. BRAHMESVARA TEMPLE, BHUBANESWAR, DISTRICT PURI.—The restoration work of the stepped tank at the back of the temple was completed.

110. JAMBESVARA TEMPLE, BHUBANESWAR, DISTRICT PURI.—Dislodged and out-of-plumb laterite Siva temple in the complex was dismantled and restored as per original and missing *amalaka* on the top was fixed by new ones.

The front part of the undulated stone floor was dismantled and after providing sand cushion, the stone slabs were reset as per the original by dressing the upper part to have a smooth surface.

111. CHAUSATH YOGINI TEMPLE, HIRAPUR, NEAR BHUBANESWAR, DISTRICT PURI.—One metre wide laterite apron was provided all around the circular temple to arrest seepage of water into the foundation.

112. NAVAKISHORE TEMPLE, BHUBANESWAR, DISTRICT PURI.—The small dilapidated Parvati temple in the complex was dismantled and reset and the platform widened and provided with stone wall to check the washing away of loose earth.

113. PARASURAMESVARA TEMPLE, BHUBANESWAR, DISTRICT PURI.—The old wooden barricades were replaced by barbed wire fencing on angle iron posts and a turnstile gate was provided in the front.

114. SUN TEMPLE, KONARAK, DISTRICT PURI.—The restoration work of the much dilapidated parapet wall on the northern and southern side was taken up and is in progress.

The entire *jagamohana* was watertightened.

The approach road leading to the Sun temple-complex was completed by stone-paved masonry work with carved drains on both sides of the road. The platform of monolithic elephants and horses was also provided with steps as per the recommendation of the UNESCO Experts.

115. JAGANNATHA TEMPLE, PURI, DISTRICT PURI.—Deplastering of the main *sikhara* was resumed and completed upto three metres all around the temple. The beautiful friezes and medallions and other exquisite carvings were exposed and the work of restoration of the much dilapidated surface detected after deplastering, is in progress. The structural repairs to the Surya temple are in progress.

The crumbled and dilapidated roof of the inner *prakara* wall known as *kurmibeda* was taken up and was nearing completion. The dilapidated roof of the *vimana saraghar* (*vahana mandapa)* was replaced by R.C.C. roof.

The pillared *mandapa* known as the *jalakrida* was deplastered and watertightened.

CALCUTTA CIRCLE

West Bengal

116. JOR-BANGLA TEMPLE, BISHNUPUR, DISTRICT BANKURA.—The roof of the temple has completely been re-terraced with rich lime-*surkhi* mortar as per original. Lime concrete terracing was also provided on the plinth of the temple. The apron of the temple has also been completely re-done.

117. MADANA MOHANA TEMPLE, BISHNUPUR, DISTRICT BANKURA.—The damaged compound wall was completely re-built by replacing worn-out bricks by specially-prepared bricks. The entire wall has been provided with coping for stopping water-seepage and further deterioration.

118. MURALI MOHANA TEMPLE, BISHNUPUR, DISTRICT BANKURA.—The collapsed south-east side verandah of the temple has been completely restored with laterite stone as per original. To strengthen the roof, mild steel bars have been inserted to check further collapse. Brick apron has also been provided around the temple to check percolation of water in the foundation. The terraces have been lime concreted.

119. RADHA VINODA TEMPLE, BISHNUPUR, DISTRICT BANKURA.—To prevent stagnation of rain water, the low lying area of the temple compound has been filled with earth and brick apron has been provided around the temple to stop water seepage into the foundation.

120. RADHEV SHYAMA TEMPLE, BISHNUPUR, DISTRICT BANKURAI— Patches of missing brick masonry of the walls and pillars and at places of the temple have been repaired with special bricks. The gateway, arches and pillars have been thoroughly repaired with ornamental bricks as per original. Lime terracing on roof and floor have been provided.

121. COOCH BEHAR PALACE, COOCH BEHAR, DISTRICT COOCH BEHAR.—Replastering the walls of the Durbar Hall and at places of the palace after removing the decayed and damaged portion and consolidation of portico by lime terracing have been completed. Missing and damaged water pipes have been changed. The Durbar Hall has been thoroughly renovated by changing doors, windows and fixing the missing brass fittings. The inside walls of the hall have also been colour washed. The outer surface of the metallic dome of the Durbar Hall has been painted with rust proof silver paint

122. HANSESVARI AND VASUDEVA TEMPLES, BANSBERIA, DISTRICT HOOGHLY.—Trees which had taken deep roots were removed and the voids and cracks were filled up with cement mortar. Water spouts were repaired to stop leakage of water on the roof. Bride tiles on the floor and all around have been relaid. Damaged brick-work on the vaulted roof was repaired by underpinning. Damaged and

pulverized plaster which had peeled off at places was scraped and the area was replastered. The doors and windows were repainted. The pits all around the temple-complex were levelled.

123. ADINA MOSQUE, MALDA, DISTRICT MALDA.—Stone masonry work on the plinth, watertightening the top of the brick pillars and repairs to the wooden floor of *Badshah-ki-Takht* have been successfully completed.

124. LUKOCHURI GATE, MALDA, DISTRICT MALDA.—Restoration of missing bricks of the pillars and lime terracing of the roof and floor have been completed.

125. HAZARDUARI PALACE AND IMAMBARA, MURSHIDABAD, DISTRICT MURSHIDABAD.—Colour-washing of the east, south and north walls, painting of doors and windows on the east, south and west, was done. Fencing with barbed wire and wire mash all along the inner circle of the palace has been completed for taking up horticultural operations and landscaping. Restoration of missing stucco work of the Durbar Hall has been successfully completed. The damaged *chhajjas* of the Imambara have been replaced with new ones (pl. LXVIII).

126. TOMB AND MOSQUE OF ALIVARDI AND SIRAJ-UD-DAULA, KHOS BAGH, MURSHIDABAD, DISTRICT MURSHIDABAD.—The work of renewing lime terracing of the pathway, wooden railings, damaged doors and other fittings have been completed. The compound wall has also been thoroughly repaired.

127. BAMAN PUKUR MOUND, BALLALDHIPI, DISTRICT NADIA.—The exposed structures at the Baman Pukur mound have been properly conserved by removing the old decayed bricks with special size bricks. The upper surface of the structures has also been watertightened to check further deterioration.

128. PALPARA TEMPLE, NADIA, DISTRICT NADIA.—The work of renewing the damaged ornamental bricks on walls as well as the restoration of the roof and basement has been completed by uprooting wild vegetation growth and, grouting the cracks with cement lime mortar. The demarcation of the protected area has been completed and the area fenced.

CHANDIGARH CIRCLE

Haryana

129. KOS MINAR, KHWAZA SARAI, DISTRICT FARIDABAD.— The pulverized masonry work of the *minar* was repaired by underpinning and plastering.

130. SURAJKUND, LAKHANPUR, DISTRICT FARIDABAD.—Besides cleaning wild vegetation and float ing plants from the Kund, the dislodged dry masonry work was reset as per the original.

131. GATEWAY OF MUGHAL SARAI, GHARAUNDA, DISTRICT KARNAL.—The fallen and missing portions of the *lakhauri* brick masonry walls of the northern gateway were restored by underpinning and pointing the walls and arches as per the original.

132. KABULI BAGH MOSQUE, PANIPAT, DISTRICT KARNAL.—The broken and fallen, missing and disturbed portions of the brick masonry work of the walls of the mosque were restored by underpinning and pointing with bricks in lime mortar. The cracks of one of the domes were stitched with country brick masonry. The work is in progress.

133. PATHAR MASJID, THANESAR, DISTRICT KURUKSHETRA.—The dislodged red sandstone flooring of the mosque was reset after replacing the damaged and weathered stones. The ramp provided all around the masjid was also restored and pointed.

134. SHEIKH CHAHELI'S TOMB, THANESAR, DISTRICT KURUKSHETRA.—The inner walls of the tomb were stabilized by grouting, underpinning and pointing with *lakhauri* brick masonry after exploring the walls.

135. SHAHJAHAN-KI-BAOLI, MEHAM, DISTRICT ROHTAK.—The pulverized and dislodged buff sand stone flooring of the platform of the well was dismantled and the resetting work was taken up. The disturbed and dislodged portions of the side wall of the well were restored by underpinning the fallen patches. The work is in progress.

Punjab

136. RAM BAGH GATE, AMRITSAR, DISTRICT AMRITSAR.—In continuation of last year's work (*1986-87,* p. 153), the dead plaster having ornamental and floral motifs from the outer walls of southern side of the *deorhi* was removed and replastered as per the original.

137. FORT, BHATINDA, DISTRICT BHATINDA.—In continuation of last year's work (*1986-87,* p. 153), the reconstruction of the bastion EOB-5 was taken up. The work is in progress.

138. TAKHT-I-AKBARI, KALANAUR, DISTRICT GURDASPUR.—The work of providing M.S. grill fencing was completed.

139. DAKHNI SARAI, MALYA, NAKODAR, DISTRICT JALANDHAR.—To avoid misuse of the monument, the protected area was enclosed by barbed wire fencing.

DELHI CIRCLE

Delhi

140. BADLI-KI-SARAI, DELHI.—The work of structural repairs, which consists of underpinning, pointing the joints, grouting the cracks and laying terrace concrete have been carried out.

141. RED FORT, DELHI.—Extensive structural repairs were carried out strictly in accordance with the original pattern under a phased programme, which involves restoration of cut and moulded red sandstone and marble parapet panels fixed with moulded plasters over the eastern wall and restoration of pulverized cut marble steps at Diwan-i-Khas and Rang Mahal.

142. SHISH MAHAL IN SHALIMAR BAGH, DELHI.—Extensive structural repairs, which involve watertightening, underpinning and resetting of damaged masonry walls and plastering were carried out strictly in accordance with the original pattern.

143. ADILABAD FORT, NEW DELHI.—Structural repairs to the fortification wall were carried out in accordance with the original pattern by way of resetting of disturbed and bulged stone masonry, underpinning the undermined gaps and stabilizing all loose masonry and watertightening.

144. HUMAYUN'S TOMB, NEW DELHI.—Extensive structural repairs to the monuments in the complex under a phased programme, which involves watertightening, underpinning and restoration of disturbed masonry in combination mortar and restoration of pulverized terrace concrete in conformity with the original pattern were carried out.

145. JAHAZ MAHAL, NEW DELHI.—Damaged and decayed moulded red sandstone were scooped out and new stones provided in consonance with the original pattern after stabilizing the core masonry.

146. KOTLA FIRUZ SHAH, NEW DELHI.—Missing pan of the southern side fortification wall was restored to the original height followed by watertightening and pointing.

147. BAOLI AT NIZAMUDDIN, NEW DELHI.—Underpinning, watertightening and resetting of bulged masonry of the stepwell were carried out.

148. PURANA QILA, NEW DELHI.—Complete restoration of collapsed part of southern fortification wall adjoining the south-western side bastion was carried out (pl. LXLX).

149. QUTB MINAR, NEW DELHI.—Structural repairs to the flutings below the first balcony were carried out by scooping out the decayed, damaged and crushed veneer stones including removal of corroded iron clamps and the same have been reproduced in consonance with the original pattern.

GUWAHATI CIRCLE

Assam

150. CACHARI RUINS, KHASPUR, DISTRICT CACHAR.—The work of terracing, plastering, underpinning, repairing of cornices, providing of brick apron; etc., was undertaken besides cutting of jungles, cleaning of vegetation, moss, lichen, etc.

151. IDGAH, RANGAMATI HILL (PANBARI), DISTRICT DHUBRI.—Cleaning of vegetation from the compound, levelling of the site, repairing of the cornices with necessary brickwork, flooring, plastering, etc. were undertaken.

152. RANGAMATI MOSQUE, RANGAMATI (PANBARI), DISTRICT DHUBRI.—Cleaning of cryptogamic growth and black patches, filling up of cracks, plastering, flooring and repairing of broken cornices of the mosque were undertaken. Besides, the ablution tank was also cleaned by removing mud, thick vegetation, etc. and finally repaired.

153. JOGIGOPHA CAVE, JOGIGOPHA, DISTRICT GOALPARA.—Clearance of vegetation and jungles, moss, lichen and black patches from the monument, repairing of wooden staircase and fixing of protection notice board were done.

154. SRI SURJYAPAHAR RUINS, DASABHUJA DEVASTHAN, SURJYAPAHAR, DISTRICT GOALPARA.—Clearance of jungles and vegetation, cleaning of moss, lichen from the rock-cut sculptures, providing of brick platform and drain for outlet of rain water were undertaken.

155. SIBDOL, NEGHERITING, DISTRICT GOLAGHAT.—Plastering and repairing of missing brickwork was undertaken besides cleaning of cryptogamic growth and providing brick-on-edge apron around the temple.

156. GROUP OF MONUMENTS, GUWAHATI, DISTRICT.KAMRUP.—Cleaning of vegetation, moss, lichen and black patches from all the monuments were undertaken.

157. ROCK-CUT TEMPLE, MAIBANG, DISTRICT NORTH CACHAR HILLS.—Cutting of jungle and removal of vegetation from the site, cleaning of moss, lichen and black patches, levelling and dressing of the compound, providing of pathway by earth cutting were undertaken.

158. TWO INSCRIBED STONES, MAIBANG, DISTRICT NORTH CACHAR HILLS.—The area around the monument has been fenced with barbed wire with cattle proof gate. The jungle growth was cleared and missing brickwork attended to.

159. GROUP OF FOUR MAIDUMS, CHARAIDEO, DISTRICT SIBSAGAR.—The area around the monument has been fenced with barbed wire with cattle proof gate. The jungle growth was cleared and missing brickwork attended to.

160. AHOM RAJA'S PALACE, GARGAON, DISTRICT SIBSAGAR.—Renewal and reproduction of missing brick works at the arches and doors, plastering of walls and ceilings, ornamental works of pillars and niches were undertaken.

161. VISHNUDOL, GAURISAGAR, DISTRICT SIBSAGAR.—Necessary conservation works i.e. missing brickwork, plastering of the ornamented design at the extrados of the *sikhara,* filling up of the long vertical crack and brick apron, etc., were undertaken, Besides, cleaning of vegetation moss and lichen from the structure, painting of the door and gate and providing of brick apron both to Sibdol and Devidol were also done.

162. GHANASHYAM HOUSE, JOYSAGAR, DISTRICT SIBSAGAR.—Cleaning of vegetation, moss, lichen and black patches from the temple and repairing and painting of fencing were done.

163. GOLAGHAR, JOYSAGAR, DISTRICT SIBSAGAR.—Terracing, flooring, plastering of the walls and ceiling, grouting of cracks with missing brick work were taken up and completed. Besides, cleaning of moss, lichen, vegetation from the structure, repairing and painting of fencing and door were also undertaken.

164. KARENGHAR, JOYSAGAR, DISTRICT SIBSAGAR.—Flooring, reproduction of missing brickwork at cornices and door openings, plastering of cells, ceilings were undertaken. Besides, cleaning of jungle and vegetation, moss, lichen, etc. from the compound was also carried out.

165. RANGHAR, JOYSAGAR, DISTRICT SIBSAGAR.—Cleaning of vegetation and jungles all around the compound, moss and lichen from the structure, providing of missing iron post and painting of fencing were done.

166. SIBDOL (BHOG-GHAR), JOYSAGAR, DISTRICT SIBSAGAR.—The old and damaged roof and floor have been repaired by fixing slates and terracing. The cracks of the joints were filled up.

167. VISHNUDOL, JOYSAGAR, DISTRICT SIBSAGAR.—Raking of old and damaged plaster from the wall of the *mukha-mandapa* of the temple and renewing of plaster thereof, renewal of damaged floor of the said *mukha-mandapa* and lime concrete apron around the main temple, grouting of cracks, were done besides cleaning of moss, lichen, vegetation and repairing of fencing etc.

168. EIGHT CANNONS OF THE AHOM PERIOD, SIBSAGAR, DISTRICT SIBSAGAR.—Cleaning of vegetation, debris around the protected area and removal of moss, lichen from the cannons and the platform, repairing of cracks of the platform and painting of grill and gate have been done.

169. SIBDOL, SIBSAGAR, DISTRICT SIBSAGAR.—The work of repairing of brick apron, plastering and missing brickwork wherever necessary, cleaning of vegetation, moss, lichen and black patches from the monument, repairing and painting of fencing has been carried out.

170. SINGRI HILL RUINS, SINGRI HILL, DISTRICT SONITPUR.—Clearance of jungles and vegetation from the site, providing of brick steps, repairing and painting of fencing were done.

171. MASONRY REMAINS ON THE BAMUNI HILL, TEJPUR, DISTRICT SONITPUR.—Cleaning of jungles and vegetation from the site, providing of bricksteps, repairing and painting of fencing were done.

172. MOUND AND RUINS OF STONE TEMPLE, DAH-PARVATIA, TEJPUR, DISTRICT SONITPUR.—Cleaning of jungles and vegetation from the monument and the compound, trimming of trees, and repairing and painting of fencing were done.

173. BORDOL, VISHWANATHGHAT, DISTRICT SONITPUR.—The intrados of the *sikhara* has been plastered and the area fenced. The area around was levelled and pathways were provided.

Manipur

174. VISHNU TEMPLE, BISHENPUR, DISTRICT BISHENPUR.—The work of cleaning of cryptogamic growth, moss, lichen, from the monument, cutting of jungles from the compound, erecting of brick pathway, levelling and dressing of the site, repairing of domes both of the temple and *mukhamandapa* and repairing and painting of the fencing were done.

175. STONE MEMORIAL OF U. MAWTHAWDUR BRIEW, NARTIANG, DISTRICT JAYANTIYA HILLS.—Jungle cutting, cleaning of moss, lichen and black patches and providing of pathway were done.

176. SCOTT'S MONUMENT, CHERRAPUNJI, DISTRICT KHASI HILLS.—The work of cleaning of vegetation from the compound and moss, lichen and black patches from the monument, dressing of the site, flooring and plastering were undertaken.

Nagaland

177. RUINS OF FORT (FORT RUINS), DIMAPUR, DISTRICT KOHIMA.—The work on the brick-on-edge pathway from ancient gateway to monolithic pillars were undertaken. Besides, cleaning of cryptogamic growth, moss, lichen, etc. from the gateway, pillars and vegetation from the site, pointing of the gateway of ancient tank were also done.

Tripura

178. SCULPTURES AND ROCK-CUT RELIEF OF UNAKOTI TIRTHA, UNAKOTI HILL, DISTRICT NORTH TRIPURA.—Cutting of wild trees and clearance of jungle from the site, cleaning of moss, lichen and black patches from the images and rock-cut sculptures, construction of temporary shed on the sculptures assembled at the hill top and providing of pathway and brick steps were undertaken.

179. GUNAVATI GROUP OF TEMPLES, UDAIPUR, DISTRICT SOUTH TRIPURA.—General clearance, patch plastering, underpinning and brickwork wherever necessary, filling up of cracks, levelling of the site and painting of fencing were undertaken.

180. TEMPLE OF CHATURDASADEVATA, UDAIPUR, DISTRICT SOUTH TRIPURA.—The cracks developed in the *mandapa* have been repaired and filled up with necessary brickwork. Besides, underpinning, patch plastering and missing brickwork, cleaning of cryptogamic growth, moss, lichen and black patches were also taken up.

181. BHUBANESWARI TEMPLE, UDAIPUR, DISTRICT SOUTH TRIPURA.—Clearance of vegetation, moss, lichen and black patches from the temple, underpinning, levelling of the compound and painting of fencing were undertaken.

HYDERABAD CIRCLE

Andhra Pradesh

182. SRI VIRABHADRASVAMI TEMPLE, LEPAKSHI, DISTRICT ANANTAPUR.—Dead concrete roof of the temple was removed and relaid with weatherproof course. The missing *chhajja* stones were replaced with granite slabs in original pattern. The sunken stone slabs of the floor were removed and relaid. The dilapidated approach flight of steps was rearranged, after replacing the missing ones matching the original pattern.

Breaches in the northern *prakara* wall of the temple have been filled in conformity with original ones and completed. The decayed wooden main door of the main temple was replaced with teak wood. Dismantling and reconstruction of disturbed *Vasanta mandapa, Nagaradhana mandapa* and *Panchangamandapas* abutting the north-western corner *prakara* wall have been completed.

183. SRI SOUMYANATHASVAMI TEMPLE, NANDALUR, DISTRICT CUDDAPAH.—The northern *gopura* of the temple which was badly damaged and decayed with several cavities was repaired by using specially-prepared bricks matching with the original pattern and restoring the stucco wherever possible. The entire surface has been watertightened by applying fresh plaster in conformity with the original.

184. SRI KODANDARAMASVAMI TEMPLE, VONTIMITTA, DISTRICT CUDDAPAH.—The southern and northern *gopuras* of the temple which were profusely damaged, with several cavities, were repaired by using specially-prepared bricks as per original pattern. The entire surface has been watertightened by applying fresh plaster in confirmity with original pattern.

185. SRI SIVAKESAVASVAMI TEMPLE, PUSIHPAGIRI, DISTRICT CUDDAPAH.—The existing roof had developed cracks and was badly pulverized. The broken beams and roof slabs were carefully removed and replaced with new ones in original pattern. It was watertightened by providing brick jelly concrete and finished with machine-pressed tiles.

186. BUDDHIST STUPA, ADURRU, DISTRICT EAST GODAVARI.—The damaged and dislodged portions of the drum walls, spokes and platforms of the excavated portions of the stupa have been reset in

ancient bricks. Pointing was done to the stupa in combination lime mortar and the spokes of the stupa were watertightened. The space between the spokes has been filled up with gravel to prevent stagnation of rain water and to arrest further decay of the spokes.

187. SRI BHIMESVARASVAMI TEMPLE, DRAKSHARAMA, DISTRICT EAST GODAVARI.—Accumulated thick lime coat was removed from the inscribed stone walls and sculptures by using suitable chemicals. The damaged and undulated stone floor inside the inner *prakara* wall of the temple was removed and relaid over a sand base.

188. SRI BHIMESVARASVAMI TEMPLE, SAMALKOT, DISTRICT EAST GODAVARI.—The thick lime coating on the stone walls of the temple was removed by using suitable chemicals. The damaged floor in the *mukha-mandapa* of the main temple was replaced with stone slabs of the same colour and texture. The old brick jelly mortar of the inner and outer *pradakshinapatha* was removed and the floor relaid with old slabs. The existing wall within the protected area was desilted to utilize the water.

189. GOLCONDA FORT, HYDERABAD, DISTRICT HYDERABAD.—While cleaning the accumulated debris inside the eastern enclosure of the Rani Mahal complex, lime plastered floor and walls came to light which were carefully exposed and neatly preserved.

On the northern and eastern sides of the Aslah Khana, decayed lime plaster was removed and replaced by fresh one. Iron grills were provided to the openings on the first floor of the Aslah Khana. The fallen bastion walls were restored with the available fallen stones to a height of 1.20 m. Rank vegetation and jungle growth from Zenana enclosure walls in front of the Rani Mahal complex and on the sides of the fort walls inside Balahissar complex was removed.

190. BUDDHIST STUPA, GUDIVADA, DISTRICT KRISHNA.—Welded iron grills have been fixed in cement concrete blocks on the eastern and south-western corners of the stupa to prevent misuse of the monument.

191. KUDAVELLI SANGAMESVARA TEMPLE, ALAMPUR, DISTRICT MAHBUBNAGAR.—Transplantation of walls of *garbhagriha* and *gudhamandapa* on east, west and northern sides upto a height of 2 m has been carried out and the pillars of *gudhamandapa* are fixed in their proper positions. Original stones of the *sikhara* were shifted from stackyard to the transplantation spot.

192. PAPANASI GROUP OF TEMPLES, ALAMPUR, DISTRICT MAHBUBNAGAR.—Recess-pointing to the walls and *sikharas* of the Papanasi group of temples, both inside and outside was attended for watertightening besides reconstruction of the parapet wall of the main temple.

193. THOUSAND PILLARED TEMPLE, HANAMKONDA, DISTRICT WARANGAL.—The sunken *adhishthana* mouldings and the concrete floor slabs of *paradakshinapatha* was dismantled and restored to the original pattern by replacing the concrete slabs with granite floor slabs after strengthening the foundations.

194. RAMAPPA TEMPLE, PALAMPET, DISTRICT WARANGAL.—After dismantling the dilapidated *nandi-mandapa,* reconstruction work of the same was being attended to in its original orientation. A strong concrete foundation was laid over which the carved architectural components were fixed in their original position upto the fifth course and fastened with stainless steel dowels. The core of the *mandapa* has been filled with plum concrete. The work is in progress.

195. WARANGAL FORT, WARANGAL, DISTRICT WARANGAL.—The pathway of the eastern gateway was cleared of the rubble scattered around the gate since it was difficult for visitors to walk through. The walls of the gateway arches have been strengthened.

196. BUDDHIST STUPA, PEDDAVEGI, DISTRICT WEST GODAVARI.—The joints of the brick structures exposed during recent excavation were pointed and an outlet provided for draining off the rain water.

JAIPUR CIRCLE

Rajasthan

197. ANASAGAR BARADARI, AJMER, DISTRICT AJMER.—Repairs to the plaster of the parapet wall, painting the steel doors of the Anasagar Baradari, levelling of pathways and spreading of morum was done.

198. NILAKANTHA MAHADEVA TEMPLE, NEELKANTH, DISTRICT ALWAR.—The work of clearance of the ancient *baoli* was in progress to further expose the steps of the well, and exposed dislodged steps were reset and pointed. Loose and bulged portion of R.R. masonry wall of the *baoli* was dismantled and resetting work is in progress.

199. BHARATPUR FORT, BHARATPUR, DISTRICT BHARATPUR.—Repairs to the fortification wall were earned out by way of eradication of rank vegetation and jungle growth, pointing of the deep and wide masonry joints and underpinning of the voids and hollows. Reconstruction of the broken portions of the fort wall was also taken up.

Wide and deep cuts caused due to erosion of slopes of the earthen mound of the Jawahar Burj were filled up with fresh clay and consolidated by ramming and watering.

200. SURAJ BHAVAN, DIG PALACES, DIG, DISTRICT BHARATPUR.—The missing or decayed wooden doors and windows with ornamental and heavy carvings were replaced with new ones as per the original pattern.

201. MONUMENTS, BADOLI, DISTRICT CHITTAURGARH.—The work of fencing the protected area was kept in progress.

202. FORT OF CHITTAURGARH, CHITTAURGARH, DISTRICT CHITTAURGARH.—Relaying of flagstone flooring in Suraj Gokhla, restoration of missing *kanguras* in Rana Kumbha palace was carried out. Dismantling of decayed lime concrete and relaying the flooring in the shops, providing and fixing new sillstones in place of the missing ones in the openings of the shops and providing stones on the steps of the underground cells in Moti and Nagina Bazar was done. Reconstruction of the fallen portion of the fortification wall near the Ram Pole was taken up.

203. FORT INCLUDING ANCIENT TEMPLES AT JAISALMER, DISTRICT JAISALMER.—The work of resetting of cracked and bulged bastion of upper fortification wall of the fort was kept in progress.

204. BUDDHIST CAVES, KOLVI, DISTRICT JHALAWAR.—Repairs to the steel doors and windows of the caves, repainting the steel work, removal of non-matching plaster work were carried out as per original.

205. TEMPLE WITH INSCRIPTIONS, KANSWA, DISTRICT KOTA.—Dismantling of uneven and dislodged flagstone flooring and relaying the same inside the temple-complex, watertightening the top of the exterior wall of the rear terrace of the temple compound by laying lime cement concrete coping on it, providing or replacing the missing and broken stone *chhajjas* of *chhatris* and southern side verandah, dismantling the decayed lime plaster on the exterior wall of surface were taken up.

206. ANCIENT RUINS AND STRUCTURAL REMAINS, KRISHNAVILAS, DISTRICT KOTA.—Clearance of Charkhambha temple by removing the fallen architectural members and stacking them properly at a suitable place was taken up. The work is in progress.

207. RANTHAMBHOR FORT, RANTHAMBHOR, DISTRICT SAWAI MADHOPUR.—The work of providing concealed steel girders in the broken stone beams and finishing the outer surface as per original, was continued in the Hamir's palace.

LUCKNOW CIRLCE

Uttar Pradesh

208. GARHWA FORT, ALLAHABAD, DISTRICT ALLAHABAD.—Lime concrete flooring was done at the entrance gate of the Fort.

209. KHUSROBAGH GATE, ALLAHABAD, DISTRICT ALLAHABAD.—Lime plaster was done on the eastern and western facade of the gateway from top of the building to the ground floor. Patch plastering was done inside the gate walls.

210. GHOSHITARAMA MONASTERY, KAUSAMBI, DISTRICT ALLAHABAD.—The area around the Ghoshitarama monastery was fenced with barbed wire.

211. EXCAVATED SITE, SAHET, SRAVASTI, DISTRICT BAHARAICH.—The loose top courses of brick masonry of excavated structures were reset and the joints pointed wherever necessary. Lime concrete pathway apron was provided around the structures.

212. SUBHNATH TEMPLE, SRAVASTI, DISTRICT BAHARAICH.—The top courses of the structures were taken out and reset in position after removing vegetation and pointing of the joints.

213. STUPA AND MONASTERY, PIPRAHWA, DISTRICT BASTI.—Re-setting of bricks and pointing of the joints in the central part of the stupa was done.

214. GULAB BARI, FAIZABAD, DISTRICT FAIZABAD.—Thick coating of lime wash over richly moulded plaster having floral designs on the western facade of the gate was scraped carefully. Damaged and decayed lime plaster on the southern side compound wall of the gate facing west was restored.

215. TOMB OF BAHU BEGUM, FAIZABAD, DISTRICT FAIZABAD.—Decayed lime plaster on the walls of the entrance gate of Bahu Begum tomb was removed and replastered as per the original.

216. PALACE RUINS ON KULPAHAR HILL, DISTRICT HAMIRPUR.—Underpinning was done with rubble stone masonry. Moulded lime plaster was put on the walls and pillars. The joints of step of the palace were pointed.

217. BARADARI, MAHOBA, DISTRICT HAMIRPUR.—Underpinning and pointing was done in the baradari and steps towards the Ghat side were reconstructed.

218. JHANSI FORT, JHANSI, DISTRICT JHANSI.—The area on north-west and south-west of the fort was fenced with barbed wire and angle iron posts.

Vegetation growth on structures and fortification wall of Jhansi fort was removed and roots penetrated into the masonry of the front wall were taken out by dismantling stone masonry. The dismantled portions were thereafter reset. Brick masonry pedestals lying inside the cells were taken out and stacked. Dead concrete on the roof terrace of cells near flagstaff bastion was removed to provide fresh lime concrete to check percolation of water. Flagstone flooring was provided in the first floor room above the Bhairon temple.

219. AMJAD ALI SHAH MAUSOLEUM, LUCKNOW, DISTRICT LUCKNOW.—The back side wall of the tomb was underpinned and lime plastered reproducing ornamental and floral designs matching with original style.

220. ASAF-UD-DAULA IMAMBARA, LUCKNOW, DISTRICT LUCKNOW.—The damaged cusped arches and pillars of the cells on both sides of the steps of the *baoli* on the ground floor were underpinned and lime plastered. Vaulted ceiling of the cells was lime plastered and lime concrete flooring was done in these cells.

Decayed lime plaster having ornamental design and carving on walls and fish-scale designs on pillars on the first gateway of the forecourt was removed and replastered in patches.

The eastern façade of the arched verandah in north-western corner of the main building was repaired by way of underpinning and plastering matching with the original.

221. BRIDGE OVER BEHTA RIVER AND TEMPLE, LUCKNOW, DISTRICT LUCKNOW.—Parapet wall of the bridge over the Behta river was reconstructed in bricks and lime-plastered. Underpinning and plastering was done on the enclosure wall of the temple.

222. DILKUSHA PALACE, LUCKNOW, DISTRICT LUCKNOW.—Lime concrete apron was provided along the wall of the Dilkusha Palace towards north side.

223. JAMI MASJID, HUSSAINABAD, LUCKNOW, DISTRICT LUCKNOW.—Plain lime plaster was done on the north-western side plinth and compound wall of the mosque.

224. NADAN MAHAL, LUCKNOW, DISTRICT LUCKNOW.—Brick-on-edge pathways leading to mosque and apron was provided.

225. QAISER BAGH GATE, LUCKNOW, DISTRICT LUCKNOW.—Richly moulded stucco works having ornamental and floral designs including plain plaster were reproduced as per the original style inside the gateway as on western façade. The fish scale designs were reproduced with lime plaster on pillars.

226. RESIDENCY COMPLEX, LUCKNOW, DISTRICT LUCKNOW.—Richly-moulded lime plaster was done over the door openings and almirah towards eastern side rooms of basement of Model Room.

Damaged graves were underpinned and lime-plastered. The compound wall of cemetery was also repaired by way of lime plaster in patches. The fallen compound wall towards the gate on the north-west side compound wall were built. New iron gate and cattle traps were fixed oh the east and north-west side of gate openings of residency complex.

227. SIKANDARA BAGH GATE, LUCKNOW, DISTRICT LUCKNOW.—Approach road and pathways have been paved and a new gate on the roadside was provided. An apron on concrete base has been provided around the medieval high compound wall. The main gateway was repaired by way of restoring collapsed roof of two rooms and providing lime concrete flooring. The decayed and broken lime plaster having rich mouldings and floral designs was restored matching with the original.

MADRAS CIRCLE

Kerala

228. FORT, TELLICHERRY, DISTRICT CANNANORE.—Underpinning of the damaged fort wall with new and old laterite stones after removing tree roots was undertaken. The fallen portions of the fort wall were reconstructed with combination mortar.

229. FORT, PALGHAT, DISTRICT PALGHAT.—The damaged portions of the fort wall were under pinned with cement mortar after removing the tree roots. Old and dead mortar over the fort wall was raked out and flush pointing was done as per the original. The moat was cleared of water weeds.

230. FORT, ANGENGO, DISTRICT TIRUVANANTAPURAM.—The fallen portions of the inner fort wall were reconstructed with laterite stones and plastered. The disintegrated plaster over the rempart walls were removed and replastered to prevent seepage of rain water. The protected area was fenced.

231. SRI PARASURAMA TEMPLE, TIRUVALLAM, DISTRICT TIRUVANANTAPURAM.—The missing portions of the stone masonry wall of the tank were reconstructed and joints pointed with combination mortar.

232. SIVA TEMPLE, PERUVANAM, DISTRICT TRISSUR.—The dead and damaged lime plaster over the walls was raked out and replastered with combination mortar. The wooden roof of the inner cloistered *mandapa* was dismantled and reset after replacing the worn-out wooden members with new ones. The wooden architectural members in the inner and outer cloisters were provided with a coat of wood preservative.

Tamil Nadu

233. FORT ON ROCK, PALLAPATTI, DISTRICT ANNA.—The broken stone beam in the Amman shrine was replaced with new one and the leaky terrace was watertightened with brick jelly concrete and flat tiles laid on top.

234. NITYAKALYANASVAMI TEMPLE, THIRUVIDANTHAI, DISTRICT CHINGLAPUT.—The *mandapa* on the northern side was completely dismantled and reconstructed as per the original.

235. MURUGANATHASVAMI TEMPLE, THIRUMURAGANPOONDI, DISTRICT COIMBATORE.—The leaky terrace of the Amman shrine was dismantled and relaid with a fresh weathering course after replacing the broken beams. The work of construction of the rear compound wall is in progress.

236. BHAGAVATI TEMPLE, CHITRAL DESAM, DISTRICT KANYAKUMARI.—The damaged and disinte grated pointing of the stone masonry revetment were removed and repointed with fresh mortar.

237. ST. MARY'S CHURCH, FORT ST. GEORGE, MADRAS, DISTRICT MADRAS.—The missing and damaged iron grills over the compound wall was replaced with new ones and painted.

238. BHAKTAVATSALA TEMPLE, SERMADEVI, DISTRICT NELLAI KATTABOMMAN.—The entrance of the sanctum was provided with an iron grilled door for security purpose. The accretionary lime wash over the walls and pillars were removed.

239. ROCK-CUT CAVE, THIRUMALPURAM, DISTRICT NELLAI KATTABOMMAN.—To avoid erosion of earth, a retaining wall of the newly formed terrace was built. A new pathway was laid, stone pitching was done to the sides and the stone joints pointed. The work of providing a culvert across the channel is in progress.

240. SOMANATHA TEMPLE, MELPADI, DISTRICT NORTH ARCOT.—The work of dismantling the damaged weathered courses of the leaky roof of *madapalli* (kitchen), *yagyasala* and out-of-plumb wall is in progress.

241. ROCK-CUT TEMPLE AND SCULPTURES, SIYAMANGALAM, DISTRICT NORTH ARCOT.—The work of watertightenjng of the *vimana* is in progress.

242. JALAKANTHESVARA TEMPLE, VELLORE, DISTRICT NORTH ARCOT.—The weathered courses, ceiling slabs, beams, capitals, pillars and basement courses were carefully dismantled and the work of re-erecting the same after laying proper foundation is in progress. The broken pillars and beams were properly mended with steel dowels (rods) and adhesive. The opening of the *prakara* wall on the northwestern corner was closed with veneer stones as per the original.

243. SUNDARA CHOLESVARA-TEMPLE, KULTHUR, DISTRICT PUDUKKOTTAI.—The entire temple including the Amman shrine was completely dismantled and reconstruction work after providing a suitable foundation is in progress.

244. MADATHUKOIL, NANGUPATTI, DISTRICT PUDUKKOTTAI.—The work of dismantling the dilapidated structure of *madapalli* and *mandapa* was completed and reconstruction of the same is in progress.

245. FORT, ATTUR, DISTRICT SALEM.—The decayed plaster on the wall of Granary II was removed and replastered with combination mortar. The leaky vaulted roof was watertightened. The work of reconstruction of the fallen portions of the fort wall with bastions is in progress.

246. FORT AND TEMPLES, CHINNAKAVANDAPUR, DISTRICT SALEM.—The dilapidated and out-of-plumb walls of the Veerabhadra shrine were dismantled and reconstructed and the terrace was provided with a fresh weathering course.

247. NARASIMHASVAMI TEMPLE, NAMAKKAL, DISTRICT SALEM.—The undulated stone flooring around he Amman shrine was partially dismantled and the work of relaying the same with new stones is in progress.

248. KALYANAMAHAL, RAJAGIRI FORT, GINGEE, DISTRICT SOUTH ARCOT.—The old and decayed lime plaster over the *mandapas* around the tank was raked out and replastered with combination mortar.

The damaged *chhajjas* were repaired by using terrace bricks, flat tiles and stone chips in combination mortar.

The fort wall near the entrance of the Rajagiri fort was rebuilt from basement level by using old available stones and new ones wherever necessary and then provided with a brick parapet wall.

249. VENKATARAMANA TEMPLE, GINGEE, DISTRICT SOUTH ARCOT.—The southern portion of the terrace of the pillared hall has been watertightened. The north-eastern corner sub-shrine has been provided with a new flight of steps. Stone flooring was provided to the open courtyard, *kalyanamandapa,* southern side to the pillared hall, eastern cloister *mandapa* and northern side of the outer *prakara.*

250. PATTABHIRAMA TEMPLE, NARASINGARAYANPETAI, DISTRICT SOUTH ARCOT.—The reconstruction of the *ardhamandapa* from the basement level was completed as per original and the roof was watertightened with brick jelly concrete. The undulated floor was levelled and relayed with cressed stones.

251. BRIHADISVARA TEMPLE, THANJAVUR, DISTRICT THANJAVUR.—The work of providing brick flooring, pointing the joints around the Karuvar, Subrahmanya and Amman shrines was completed.

252. SIVAGANGA LITTLE FORT, THANJAVUR, DISTRICT THANJAVUR.—The missing portions of the brick basement of the channel were rebuilt. The existing dwarf wall of the pathway was repaired and missing portions were reconstructed with new bricks in combination mortar and plastered.

The damaged portions of the dwarf wall of the 'star bed' were carefully cleaned and reconstructed as per original by replacing the weathered bricks with new ones wherever necessary.

The rampart wall was cleared off the vegetation growth. The decayed and weathered bricks were removed and reconstructed with country bricks in combination mortar.

253. SIVA TEMPLE, VALIKANTAPURAM, DISTRICT THIRUCHIRAPALLI.—New stone flooring in cement mortar was laid over a bed of brick jelly concrete inside the *mandapalli* (kitchen) and near the *dvarapalaka.*

MINI CIRCLE

Goa

254. FORT, AGUADA, GOA.—The work of the restoration of breached portion of the fort wall with laterite stone masonry in combination mortar is in progress.

255. SAFA MASJID TANK (MOSQUE), PHONDA, GOA.—Most of the fallen arches were reconstructed and flooring reset and platform over the arches repaired. Repairs to the parapet wall of the tank is in progress.

256. BOM JESUS BASILICA, OLD GOA.—A pan of the enclosure wall was restored in laterite stone masonry in combination mortar.

257. LADY ROSARY CHURCH, OLD GOA.—The stone flooring adjoining the altar was removed and relaid over concrete base. The plastering work is in progress.

258. SE. CATHEDRAL, OLD GOA.—The dead plaster of drains of side terrace was removed and replastered in combination mortar.

259. ST. ASSISI CHURCH, OLD GOA.—The damaged Mangalore tiles were replaced. The damaged wooden terrace and doors and windows were also repaired.

260. ST. AUGUSTINE CHURCH, OLD GOA.—In order to improve the surroundings the growth of vegetation and accumulation of debris were removed.

261. ST. CAJETAN CHURCH, OLD GOA.—Repairs to the side towers is in progress.

262. ST. CATHERINE CHURCH, OLD GOA.—Fencing work was completed. The damaged doors were repaired. Damaged and decayed wooden members of the roof were changed with new ones. Dislodged laterite stones of the bell tower were reset.

MINI CIRCLE, SHIMLA

Himachal Pradesh

263. BANSI GOPAL TEMPLE, CHAMBA, DISTRICT CHAMBA.—The old and decayed wooden *chhatri* of the temple was replaced with new one and broken and missing slates replaced.

264. BRIJESVARI DEVI TEMPLE, CHAMBA, DISTRICT CHAMBA.—The work of resetting the dislodged, sunken and damaged stone flooring was taken up and completed.

265. CHAMUNDA DEVI TEMPLE, CHAMBA, DISTRICT CHAMBA.—In continuation of previous year's work the random rubble masonry work of the retaining wall was continued. The work is in progress.

266. LAKSHMI-NARAYANA GROUP OF TEMPLES, CHAMBA, DISTRICT CHAMBA.—The roof slates of the canopy of the Chandragupta temple have been replaced with new ones.

267. SITA-RAMA TEMPLE, CHAMBA, DISTRICT CHAMBA.—The missing slates and decayed wooden members of the *chhatri* of the *sikhara* of the temple were dismantled and replaced with new slates and wooden members as per the original.

268. ROCK-CUT TEMPLE, MASRUR, DISTRICT KANGRA.—In order to keep the monument presentable, the settled debris dumped on the floor of the courtyard was removed and the hidden flooring exposed.

269. MINIATURE SIVA TEMPLE, JAGATSUKH, DISTRICT KULLU.—The work of providing flagstone flooring in front of the temple over a raised platform was taken up and completed. The drains provided earlier were repaired.

270. HIDIMBA DEVI TEMPLE, MANALI, DISTRICT KULLU.—In continuation of last year's work (*1986-87,* p. 166) the decayed wooden shingles of the roof projection of the first tier on north and east side of the temple have been replaced with new wooden shingles as per original.

271. VISVESVARA MAHADEVA TEMPLE, BAJAURA, DISTRICT KULLU.—The left-out portions of flooring inside the compound wall of the temple were provided with stone flooring. The foundation of the stone masonry enclosure wall facing north and northwest was provided with thick concrete cutter wall in cement mortar to avoid seepage of water into the foundation of the temple. The work of watertightening the leaking *sikhara* is in progress.

272. BUDDHIST MONASTERIES, TABO, DISTRICT LAHUL AND SPITI.—The work of reconstruction of the boundary wall on the north-east side was taken up in random rubble stone masonry in cement mortar after dismantling the bulged and dislodged walls. The work of raising pise wall over the stone masonry wall on the east side was completed. Besides, the wide cracks developed in the inner wall of the entrance porch of the Duwang Gompa was stitched and the leaking roof of the *gompas* wherever necessary have been watertightened. The settled debris in and around the complex was levelled.

273. ARDHANARISVARA TEMPLE, MANDI, DISTRICT MANDI.—In continuation of previous year's work (*1986-87,* p. 166) the dislodged *sikhara* of the temple was dismantled carefully and the core of the *sikhara* was watertightened and restored after removing the pipal tree. Resetting of the *sikhara* was taken up and completed as per original (pl. LXX).

274. TRILOKINATH TEMPLE, MANDI, DISTRICT MANDI.—In order to drain out the rain water, drain was provided all around the temple.

PATNA CIRCLE

Bihar

275. EXCAVATED REMAINS, ANTICHAK, DISTRICT BHAGALPUR.—The collapsed, decayed and dislodged portions of the northern monastery were reconstructed with special size of bricks in lime, *surkhi* cement mortar, including underpinning, watertightening the joints, etc., as per the original.

276. SHER SHAH SURI'S TOMB, SASARAM, DISTRICT ROHTAS.—The loose, decayed, dislodged veneer stones of the circular dome of the main tomb were refixed.

Ultar Pradesh

277. FORT. JAUNPUR, DISTRICT JAUNPUR.—The collapsed portion on the southern wall was rebuilt as per the original.

278. DHAMEKH STUPA, SARNATH, DISTRICT VARANASI.—Decayed and dislodged bricks of the drum of the Dhamekh Stupa were dismantled and reset and the cracks stitched and joints pointed.

SRINAGAR CIRCLE

Jammu and Kashmir

279. MARTAND TEMPLE, RANBIROORA, DISTRICT ANANTNAG.—The weathered stones of the apron were removed and replaced by new ones and stone flooring of the *mandapa* was attended to.

280. MUGHAL ARCADE, VERINAG, DISTRICT ANANTNAG.—The masonry work and the lime concreting of the octagonal arcade was completed and the fixing of the *chhajja* stones taken up.

281. RAJAVIHARA, PARIHASPORA, DEVAR, DISTRICT BARAMULA.—The main entrance of the monastery was taken up for repairs by way of removing the accumulated earth and replacement of missing stones with the available stones at the site. Repairs to the steps were completed. The repair work to the long side walls of the structure is in progress.

282. STUPA, PARIHASPORA, DEVAR, DISTRICT BARAMULA.—The repairs to the southern steps of the stupa were attended to by removing the accumulated debris and fallen stones and filling the core with the rubble stones and restoring the masonry. The first phase of repair has been completed. The work is in progress (pl. LXXI).

283. STUPA AT TISSERU, LEH, DISTRICT LEH.—Repairs to the first circular terrace and second circular terrace have been taken up (pl. LXXII). The work is in progress.

284. AVANTISVAMIN TEMPLE, AVANTIPORA, DISTRICT PULWAMA.— Out-of-plumb stones and weathered and the damaged parts of the temple plinth were taken up for repair with the available old stones and the work is in progress. Repairs to the cells of the peristyle were also carried out and out of 84 cells 12 cells have been completed. The work is in progress.

285. AVANTISVARA TEMPLE, AVANTIPORA, DISTRICT PULWAMA.—The damaged portions of the peristyle of the temple which was in a precarious condition, were pulled and restored as per the original with available stones. Repairs were also carried out to the miniature shrine.

286. AKHUND-MULLA SHAH, SRINAGAR, DISTRICT SRINAGAR.—The openings of the mosque were provided with doors. The accumulated debris inside the mosque was removed and stone flooring was provided.

287. PARI MAHAL, SRINAGAR, DISTRICT SRINAGAR.—The huge accumulated debris from the top of the entrance roof was removed and lime concrete was laid as per the original features to avoid leakage. The dilapidated tank on the fourth terrace was also repaired and is being made functional. The work is in progress.

288. SHANKARACIIARAYA TEMPLE, SRINAGAR, DISTRICT SRINAGAR.—The modern brick parapet wall which was built sometimes in the past has been removed and replaced with fine chisel-dressed stones with mouldings as per the original available traces. The work is in progress.

289. NARANAG GROUP OF TEMPLES, WANGATH, DISTRICT SRINAGAR.—These miniature shrines of second group of temples have almost fallen down due to vagaries of nature and their plinth had become disjointed. Repair work was taken up to resurrect the architectural features of these shrines. The entire fallen stones of miniature temple no. 3 and 5 of the second group of temples were removed and re-erected after proper dressing up of the stones. The work is in progress.

The fallen retaining wall was taken up and was restored to a great extent. The hidden portion of the compound wall was exposed and remaining part restored with the available material.

The accumulated earth around the miniature temples and the pillared hall was removed and the steps which were in dislodged condition were repaired with available stones as per the original. The small miniature temple by the side of the pillared hall which had also suffered due to vagaries of nature and time was repaired with the available stones as per the evidence available.

290. GROUP OF TEMPLES, KIRAMCHI, DISTRICT UDHAMPUR.—In continuation of the previous year's (*1986-87,* p. 168) work, the flooring of the temple 5 was taken up and completed.

The steps of the temples which were in a dislodged condition were taken up for repairs. The huge accumulated debris was removed and the flight of steps and its flanking walls were repaired as per the original.

The remains of two miniature shrines were also taken up for repairs. The accumulated debris was removed and the plinth and walls of the temple shrines were repaired as per the original traces.

Due to vagaries of time and neglect, the temple 4 had developed wide cracks. The affected portions were dismantled and reset. The work as per the original is in progress.

291. DERA TEMPLE, BABORE, DISTRICT UDHAMPUR.—In continuation of previous year's (*1986-87,* p. 168) work, the repair to the front wall of the *mandapa* of the temple was taken up and is in progress.

The *manaapa* wall of the Kala Dera Temple II facing east which was partly missing was restored with new mouldings. The work is in progress.

292. NAWA MAHAL, RAMNAGAR, DISTRICT UDHAMPUR.—The fallen ornamental plaster of walls was taken up for repairs. The missing portion of the walls was restored with the available brick tiles as well as the new ones. The wooden roof wherever missing was also provided.

293. PURANA MAHAL, RAMNAGAK, DISTRICT UDHAMPUR.—In continuation of previous year's (*1986-87,* p. 169) work the wide cracks developed in the western fortification of Purana Mahal complex was taken up for repairs and restored as per the original.

294. SHEESH MAHAL (RAJA SUCHET SINGH'S PALACE), RAMNAGAR, DISTRICT UDHAMPUR.—Flower designs and mouldings were reproduced and the work is in progress.

VADODARA CIRCLE

Daman and Diu

295. FORT WALL, MOTI DAMAN.—The work of dismantling worn-out ashlar stone masonry and resetting the same, removal of dead lime and providing new concrete, construction of missing R.R. masonry and underpinning and watertightening the top of wall was taken up.

Gujarat

296. AHMED SHAH MOSQUE, AHMEDABAD, DISTRICT AHMEDABAD.—In continuation of previous year's work, the remaining work of replacement of worn out and damaged brackets, lintels, capitals, etc. was completed.

297. DADA HARIR'S MOSQUE, AHMEDABAD, DISTRICT AHMEDABAD.—The missing ashlar stone masonry, including intricately carved stone *jalis,* were provided.

298. RANI SIPRI MOSQUE, AHMEDABAD, DISTRICT AHMEDABAD.—The worn-out ashlar stone masonry was dismantled and provided with new masonry.

299. ANCIENT SITE, LOTHAL, DISTRICT AHMEDABAD.—The dockyard was desilted and special sized bricks were procured.

300. GREAT MOSQUE, SARKHEJ, DISTRICT AHMEDABAD.—Bulged and out-of-plumb ashlar stone masonry was dismantled and reconstructed and the missing *kanguras* provided.

301. JAMI MASJID, BHARUCH, DISTRICT BHARUCH.—The worn-out and damaged brackets, lintels, capitals have been replaced with new ones afier dressing and carving as per original. Parts of the roof ashlar masonry was dismantled to facilitate the replacement of broken lintels.

302. ANCIENT SITE, SURKOTADA, DISTRICT BHUJ.—All the dilapidated and collapsed structures were restored and watertightened after clearing the area of vegetational growth.

303. DVARAKADHISH TEMPLE, DWARKA, DISTRICT JAMNAGAR.—In continuation of last year's (*1986-87,* p. 170) work, the ashlar masonry of fourth and fifth storeys was restored as per original. Broken lintels, brackets, roof slabs etc. were replaced (pl. LXXIII).

304. BUDDHIST CAVES, JUNAGADH, DISTRICT JUNAGADH.—The worn-out steps and floors were chiselled out and rendered even.

305. SURYA KUND, MODHERA, DISTRICT MAHESANA.—The work of dismantling and resetting of tilted and bulged ashlar masonry steps and miniature shrines of the *kunda* was continued.

306. SUN TEMPLE, MODHERA, DISTRICT MAHESANA.—In continuation of last year's (*1986-87,* p. 170) work, missing stone *chhajjas* in south-west and north-east comer of the *nrityamandapa* were provided as per original pattern.

307. RANI-KI-VAV, PATAN, DISTRICT MAHESANA.—Remaining portion of the main shaft of the *vav* was desilted. The bulged ashlar stone masonry wall was dismantled and reset as per original. Missing ashlar masonry steps were restored (pl. LXXFV).

308. SHEIKH FARID TOMB, PATAN, DISTRICT MAHESANA.—The remaining work of protection wall with bastions was completed.

309. CITADEL WALL, PAVAGADH, DISTRICT PANCHMAHALS.—Bulged ashlar masonry wall of the fort was dismantled and reconstructed with new stones and the top walls watertightened.

310. EXCAVATED SITE, PAVAGADH, DISTRICT PANCHMAHALS.—The vegetational growth from the excavated site was removed. The decayed and damaged parts of brick structures were dismantled and reconstructed on original patterns.

311. JAMI MASJID, PAVAGADH, DISTRICT PANCHMAHALS.—Damaged and sunken ashlar stone ma sonry was dismantled and provided with new ones, and broken *chhajjas* was replaced with new dressed and carved ones.

312. KABUTAR KHANA, PAVAGADH, DISTRICT PANCHMAHALS.—The work of removing dead concrete and providing with new one, and underpinning the brick masonry was taken up.

MONUMENTS MAINTAINED BY THE STATES

ANDHRA PRADESH

Conservation works at the following monuments were carried out by the Department of Archaeology and Museums, Government of Andhra Pradesh :

1. Gagan Mahal, Penukonda, District Anantapur
2. Brahma and Virabhadra temples, Chebrolu, District Krishna
3. Fort, Koodapalli, District Vijayawada
4. Victoria Jubilee Museum Building, Vijayawada, District Vijayawada

BIHAR

The Department of Archaeology, Government of Bihar, carried out conservation works at temple complex, Maluti, in District Dumka. Out of seventy-four temples, nineteen were taken up for repair by removal of vegetation, resetting, watertightening and pointing. The work is in progress.

GUJARAT

The Department of Archaeology, Government of Gujarat, carried out the following conservation works:

1. Stepwell at Shamlaji, Taluka Bhiloda, District Sabarakantha
2. Ancient stepwell at Hampur, Taluk Dhrangadhara, District Surendranagar
3. Vidyadhar-ki-Vav, Sevasi, District Vadodara

KARNATAKA

The Department of Archaeology and Museums, Government of Karnataka, carried out conservation works at the following monuments:

1. Kittue Palace, District Belgaum
2. Basement of *mandapas,* Ther Bazar Hampi, District Bellary
3. Yoganarasimhasvami temple, Mudigere, District Hassan
4. Sri Chamundesvari temple, Chamundi Hill, District Mysore
5. Trikuta Basadi, Chikkahanasoge, Taluk K.R. Nagar, District Mysore
6. Prasanna Krishnasvami temple, Mysore Palace Fort, District Mysore

MADHYA PRADESH

The Department of Archaeology and Museums, Government of Madhya Pradesh, carried out conservation works at the following monuments:

1. Siva temple at Budnagar, District Dhar
2. Rajwada palace, Indore, District Indore

3. Royal palaces, forts and temples at Mandasaur, District Mandasaur
4. Siva temple, Bilpalngwas, District Ratlam
5. Fort, Shivpuri, District Shivpuri
6. Mangaladevi temple, Sakpur, District Vidisha

MANIPUR

The Department of Archaeology, Government of Manipur carried out the following conservation works:

1. TEMPLE OF LEIMAPOKPA KEIPUNGBA, IMPHAL, DISTIRCT IMPHAL.—Vegetation growth was cleared off and wherever necessary tree-killer was injected to check further growth of big plants and trees. The dislodged walls at the northeastern corner have been restored.

2. TEMPLE OF SHRIGOVINDAJI AND BEITHAB, KANGLA, IMPHAL, DISTRICT IMPHAL.—The area around the temple was cleared off all vegetation growth. Iron clamps were provided to the upper walls of the Beithab to strengthen the structure.

3. TEMPLE OF BRINAMCHANDRA, KANGLA, DISTRICT IMPHAL.—Vegetation growth was removed.

4. GATEWAY OF MAHARAJ GAMBHIR SINGH, LANGTHABAL, DISTRICT IMPHAL.—Vegetation growth over the gateway of Maharaj Gambhir Singh was removed and butteress supports have also been provided to prevent further leaning of the western wall.

5. THANGAL GENERAL TEMPLE, WANGKHEI, DISTRICT IMPHAL.—The damaged portion of the walls were replastered with lime *surkhi* mortar. The staircase on four sides was repaired maintaining original slope and gradient. The minor shrine on the north-eastern corner of the main temple was rebuilt using original materials. The area around the temple was levelled and fenced with barbed wire. Approach road was also provided on the western side of the temple and lamp posts erected on four corners of the temple-complex.

RAJASTHAN

Conservation, preservation and clearance works were done at the following important monuments by the Department of Archaeology and Museums, Government of Rajasthan:

1. Siva-*linga,* Nand, District Ajmer
2. Akbar's fort, Ajmer, District Ajmer
3. Jal Mahal, Kumbher, District Bharatpur

4. Chopra Mahadeva temple, District Dholpur
5. Talab Shahi, Bari, District Dholpur
6. Raja Bharmal-ki-chhatari group, Amber, District Jaipur
7. Raj Mahal palaces, Amber, District Jaipur
8. Maharaja's chhatari, Gaitore, District Jaipur
9. Mughal gateway, Viratnagar, District Jaipur
10. Fort and topkhana, Jalore, District Jalore
11. Panch Kunda, Mandore, District Jodhpur
12. Dewals, Mandore, District Jodhpur
13. Monuments at Zenana Bagh, Mandore, District Jodhpur
14. Hari-Hara temple, Osian, District Jodhpur

X. EXPEDITION OUTSIDE INDIA

PRESERVATION OF ANGKOR VAT TEMPLE, SIEMREAP, CAMBODIA

In continuation of the previous year's work (*1986-87,* pp. 177-178), the Survey resumed the work of documentation, conservation and preservation of the Angkor Vat temple complex under a bilateral agreement between India and Cambodia, under K.P. Gupta, Superintending Archaeologist as team leader with the assistance of M.M. Kanade, R. Veeraraghavan, L.L. Shah, D.T. Karamchandani, G. Hanumantha Rao, D.S. Sood, M.L. Gupta, P.S. Gupta, Madhav Sarma, S.K. Jain, J.S. Bisht, B.R. Rajput and Ramsahai

STRUCTURAL PRESERVATION: The dilapidated northern side of the stepped embankment was dismantled and reconstructed by laying a thick concrete bed and by constructing a retaining wall of laterite masonry for the entire height of the embankment, so as to retain the earth behind and providing transverse drain for effective drainage.

The affected portions of the Esplanade and Library buildings were also dismantled and reset. The dislodged stone flooring of the Esplanade has been reset after dressing sides and top. Sunken floors were removed and replaced with a new ones. Bulged and out-of-plumb walls of the Library building were dismantled and reset as per the original after strengthening the foundation (pl. LXXV). Vaulted roofs of almost all the porches were consolidated by grouting, pointing and watertightening.

The scattered architectural members of Samudramanthan Gallery III enclosure and south-eastern pavilion was also reconstructed. Leaning door of the eastern gallery was reconstructed. The damaged stones were mended with epoxy resin wherever required. Recess pointing with proper colour matching was also carried out to the pavilion, vault, semi-vault, plinth and floors.

CHEMICAL CONSERVATION: The removal of thick growth of moss and lichen of northern and southern Library between III and IV enclosures was minimized by using 1 to 2% solution of liquid ammonia in aqua medium and 1% solution of teepol (pl. LXXVI). Chemico-mechanical methods were employed for the removal of superficial accretion, like dust and dirt. The cleaned area was given a coat of 1% sodium of polymethyl-methacryllate in toluene.

In the Esplanade between IE and IV enclosure the draining platform, fluted pillars and railings were giving a patchy appearance due to vegetational growth which was removed by using 1% solution of ammonia. The treated area was given a coat of 1% of sodium pentachlorophenate as fungicide followed by 2% solution of preservative methyl methacryllate in toluene.

The vaulted roof, semi-vaulted roof, pillars, plinth platform including the pavilions were also subjected to chemical treatment using 1 to 2% solution of ammonia in aqua and 1 % of teepol followed by brushing for the removal of dust, dirt and greasy matter (pl. LXXVII).

XI. ARCHAEOLOGICAL CHEMISTRY

TREATMENT OF MONUMENTS AND PAINTINGS[1]

ANDHRA PRADESH

1. CHARMINAR, HYDERABAD, DISTRICT HYDERABAD.—Chemical cleaning for eradication of vegetation growth from north-east and north-west minarets of the Charminar was taken up by using 3:1 mixture of aqueous ammonia and teepol. A 2% aqueous solution of sodium pentachlorophenate was applied to the cleaned surfaces as fungicidal followed by preservation with 3% solution of polymethyl methacrylate in toluene.

ASSAM

2. BISHNUDOL TEMPLE, SIBSAGAR, DISTRICT SIBSAGAR.—Growth of microphytes and deposition of dust, dirt, etc., on the exterior wall of the temple was removed by using mixtures of dilute aqueous ammonia and detergent together with other organic solvents. The walls were thereafter coated with fungicide followed by preservative.

3. SIBDOL TEMPLE, SIBSAGAR, DISTRICT SIBSAGAR.—Thick growth of moss, lichen, algae and deposits of dust and dirt on the exterior wall of the temple was removed by using aqueous ammonia mixed with detergent. Black patches were leached off by using dilute solution of oxalic acid. Double coatings of fungicides viz. zinc silicofluoride and sodium pentachlorophenate were provided followed by a coat of preservative.

BIHAR

4. MAURYAN PILLAR, KUMRAHAR (PATNA), DISTRICT PATNA.—Thick growth of moss and lichen, greasy accretions and dust and dirt were removed from the pillar by applying 5% aqueous solution of sodium carbonate followed by cleaning with aqueous solution of oxalic acid mixed with teepol. Surface of the pillar was then polished with wax polish using soft cloth and finally preserved.

5. SHER SHAH'S TOMB, SASARAM, DISTRICT ROHTAS.—Accretions of dried vegetation growth and patches of lichen were removed by using 5% aqueous solution of ammonia and scrubbing with soft nylon brushes. A 2% solution of teepol was used for the removal of dust and dirt. To check further

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'Information from Director (Science) of the Chemistry Branch of the Survey except the items 9,11, Hand 16 which were received from Director, Archaeology and Museums, Government of Gujarat and 44, 45 and 47 from Director, Archaeology and Museums, Government of Rajasthan.

growth of algae, etc., a 2% aqueous solution of zinc silicofluoride was sprayed over the cleaned surfaces, followed by preservation with 3% solution of polyvinyl acetate in toluene.

Black patches of lichen from subsidiary domes and parapet wall were eradicated by using 5% aqueous solution of oxalic acid and the dust and dirt were removed by 2% aqueous solution of teepol B-300. Paint marks were removed by applying equimolar solutions of methanol, benzene, acetone and ammonia. Zinc silicofluoride and polyvinyl acetate were again used as fungicide and preservative respectively.

DAMAN AND DIU

6. CANONS, DIU FORT, DIU.—Alloyed structures of the cannons at Diu Fort complex were thickly covered with rust and other deposits. These cannons were successfully cleaned chemically and preserved.

GOA

7. SE CATHEDRAL CHURCH, VELHA GOA.—Gilded altars were dusted for removal of superficial deposit, dust, etc. In addition, certain canvas paintings were subjected to chemical cleaning using selective organic solvents and were finally preserved with 1% varnish.

8. ST. FRANCIS OF ASSISI CHURCH, VELHA GOA.—Panel and canvas paintings of the church were subjected to chemical cleaning using different organic solvents in variable proportions. Relining, retouching and patch works were also attended to wherever needed. The cleaned paintings were finally preserved with 1% varnish. In addition to above, altars were also dusted to give bright look.

GUJARAT

9. WOODEN HAVELI, AHMEDABAD, DISTRICT AHMEDABAD.—The wooden members affected by soil termites were chemically treated by using Gammaxin powder, aldrine, copper-chrome, arsenate solution and mercuric-chloride.

10. DARBARGADH PALACE, SIHOR, DISTRICT BHAVNAGAR.—Beautiful wall paintings were exposed in the upper portion room of old Darbargadh palace by chemical treatment. These paintings have been preserved suitably after exposition.

11. LAKHOTA PALACE, JAMNAGAR, DISTRICT JAMNAGAR.—The bronze statue of Maharaja Jam Raval were treated mechanically by using anti-vegetation, hydrochloric acid and sodium hydro-oxide.

12. RANI-KI-VAV, PATAN, DISTRICT MAHESANA.—Chemical treatment and preservation work was initiated to the sculpture on the first landing of the first phase of Rani-ki-Vav.

13. SUN TEMPLE, MODHERA, DISTRICT MAHESANA.—Thickly covered old hard lime inscrustations from the stone sculpture were removed using different suitable chemicals viz. acetic acid, methanol, acetone, etc.

14. ANCIENT TEMPLE, VISNAGAR, DISTRICT MAHESANA.—The lime wash from the western wall of the temple was treated with water dilute acetic acid and distilled water. Salt affected sandstones were cleaned by paper pulp method and finally consolidated by 3% polyvinyl acetate in toluene.

15. SHAHAR-KI-MASJID, PAVAGADH MONUMENT, CHAMPANER, DISTRICT PANCHMAHALS.—This ancient mosque was thickly covered with moss and lichen and was subjected to chemical treatment and preservation. Exterior and front portions of mosque were chemically cleaned and preserved. The pillars of the outer varandah of the mosque and lower portions of the richly carved minarets, which were quite dark before the chemical treatment, gave a bright look.

16. TEMPLE, TARNETAR, DISTRICT SURENDRANAGAR.—Thick coat of limewash was removed mechanically by using water and dilute solution of acetic acid. Soft affected sandstones were also cleaned by paper pulp process and finally consolidated with 3% polyvinyl acetate in toluene.

HARYANA

17. SHAH QULI KHAN TOMB, NARNAUL, DISTRIC MAHENDERGARH.—The floor surface and interior walls of the tomb were partly fixed with marble stone which turned yellow and blackish due to hard accretions, dust, smoke, etc. Dilute solutions of hydrogen peroxide, liquor ammonia and detergent were used with soft nylon brushes. The work is still in progress.

HIMACHAL PRADESH

18. LAKSHANA DEVI TEMPLE, BHARMOUR, DISTRICT CHAMBA.—Thick layers of paint, smoke etc., from the wooden carvings were subjected to chemical treatment using dilute solutions of triethanolamine, detergents and various other organic solvents.

19. SANDHYA GAYATRI TEMPLE, JAGATSUKH, DISTRICT KULLU.—The carving of Sandhya Gayatri Devi Temple which were covered with thick paint layers, dust, dirt, grease and smoke was taken up for chemical treatment Dilute solution of triethanolamine, aqueous ammonia and teepol were used with soft nylon brushes for the removal of smoke, grease and other accretions.

JAMMU AND KASHMIR

20. SIVA TEMPLE, PANDRETHAN, DISTRICT SRINAGAR.,—Inner surface of the temple was subjected to chemical cleaning by using liquor ammonia and detergent with soft nylon brushes. The entire surface of temple was thereafter preserved with 2% solution of polymethyl methacrylate in toluene.

21. PATHER MASJID, SRINAGAR, DISTRICT SRINAGAR.—The exterior wall of the masjid, facing south, which was covered with dust, dirt and yellowish inscrustations, was treated with dilute aqueous solutions of detergent and ammonia. The hard crust at places were removed mechanically. Thereafter the entire surface was subjected to preservation with 2% solution of polymethyl methacrylate in toluene after the application of fungicide.

KARNATAKA

22. AMRITESVARA TEMPLES, AMRITPURA, DISTRICT CHIKMAGALUR.—Removal of deleterious growth of micro vegetations from the exterior and oil, soot, etc., from interior of northern entrance, sanctum *navaranga andsukanasi* of the temple were taken up by using aqueous solution of neutral detergent and liquor ammonia. A 1% aqueous solution of sodium penta chlorophenate was used as fungicide and 2% solution of polymethyl methacrylate in toluene as preservative. The work is in progress.

23. GROUP OF TEMPLES, LAKKUNDI, DISTRICT DHARWAR.—Eradication of thick vegetation growth and calcarious deposits from old Jaina basti, old entrance gate, Kashi Vishwanath and Nanesvara temples were taken up by using aqueous solutions of non-ionic detergent and liquor ammonia, acetic acid and sodium hexamataphosphate etc. The work is in progress.

24. SRIKANTHESVARA TEMPLE, NANJANGUD, DISTRICT MYSORE.—Eradication of oily accretions from the images in the northern *dalan* of the temple were taken up by using a 5% aqueous solution of a mixture of natural detergent with liquor ammonia in the ratio of 1:2 followed by 2% acrypol clear-P. 876 G 001 pellets in toluene as preservative.

25. MADHUKESVARA TEMPLE, BANAVASI, DISTRICT NORTH CANARA.—The sculptures in the subsidiary shrines arid the *navaranga* of the main shrine were subjected to chemical treatment. Moss and lichen was removed by using aqueous solution of teepol-N and liquor ammonia, and lime wash cleared by using aqueous acetic acid solution. Chemically cleaned area was treated with 1% aqueous solution of sodium pentachlorophenate as fungicide.

26. RAMESVARA TEMPLE, KELADI, DISTRICT SHIMOGA.—Chemical cleaning of the sculptures in Ramesvara, Virabhadra and Parvati shrines was taken up for the removal of limewash, soot and oily patches together with vegetation growth. The chemicals used were aqueous acetic acid and teepol-N and liquor ammonia followed by a coat of sodium pentachlorophenate in water as fungicide and finally the areas were preserved with 2% solution of acrypol-P. 876 G 001 in toluene. The work is in progress.

MADHYA PRADESH

27. LAKSHMANA TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR.—Eradication of lime wash and bacterial slime etc. from *maha-mandapa* of the temple (north side) was taken up and removed by

using 2% aqueous solution of acetic acid and mixture of 3% aqueous ammonia and non-ionic detergent. Fungicide treatment was given to clean stone surface followed by 2% solution of polymethyl methacrylate in toluene as preservatives.

28. SCULPTURES, JARDINE MUSEUM, KHAJURAHO, DISTRICT CHHATARPUR.—Loose sculptures of the museum were subjected to chemical treatment for cleaning of biological accretions by using saponified aqueous ammonical solution. The surfaces were thereafter given fungicide treatment and finally preserved with 2% solution of perspex in toluene.

29. KANDARIYA MAHADEVA TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR.—Thick deposits of moss and lichen were removed from *maha-mandapa* by using ammonical water containing non-ionic detergent. A 1% solution of acetic acid was used for removing lime wash accretions, wherever necessary. Fungicidal treatment was given to the cleaned surfaces followed by 2% solution of polymethyl methacrylate in toluene as preservative.

30. BAGH CAVES, BAGH, DISTRICT DHAR.—Mounting of stripped panels of paintings of façade was carried out in Cave 4. After removing the ground which comprised of mud, husk and stone pebbles, and stripped panels were mounted in fibre glass with epoxy resin. In order to arrest the insect activities in Cave 2, 3 and 4 routine fumigation with aluminium phosphide and ethylene dibromide for eradication of bats and fumigation with 10% solution of formaldehyde and Baygon containing pyrethrum and malathion was carried out.

31. BAHU TEMPLE, GWALIOR FORT,.GWALIOR, DISTRICT GWALIOR.—Chemical cleaning for eradication of biological growth and lime wash was carried out in the temple by using mixture of dilute liquor ammonia and non-ionic detergent and dilute acetic acid. Cleaned surfaces were given fungicidal treatment followed by 2% solution of perspex in toluene as preservative.

32. CHAUSATH YOGINI TEMPLE, BHERA GHAT, DISTRICT JABALPUR.—Hidden details of carvings and ornamentation of the sculptures of the temple were exposed chemically by using 3% solution of liquor ammonia mixed with non-ionic detergent and 1% solution of acetic acid. Sodium pentachlorophenate was used as fungicide. Thereafter it was finally preserved with 2% solution of polymethyl methacrylate in toluene.

MAHARASHTRA

33. AJANTA CAVES, AJANTA, DISTRICT AURANGABAD.—Consolidation of loose plasters and paintings, filling of holes, cracks and edging was also attended to in Caves 1, 2, 9, 11 and 17 by using plaster of Paris in suitable proportions. Alluvial local mud was also used for edging as per the recommendations of Expert Committee'. The results are under observation.

Chemical treatment to the façade sculptures of Cave 1 and 26 was also carried out by using 1 to 3% solution of ammonia in distilled water mixed with little quantity of non-ionic detergent such as teepol for the removal of moss, lichen, dust and dirt etc. This was followed by insecticidal treatment with sodium penta-chlorophenate and zinc-silico-fluoride and finally preserved with 2% solution of polyvinyl acetate in toluene.

To arrest insect activities, insecticidal spraying is being conducted regularly in Cave 1,2,16 and 17 with 0.25% solution of pyrethrum in kerosene which has proven very effective.

In addition to the above, diurnal recording of temperature and relative humidity is being conducted regularly and monitoring of intensity of light illumination is also being studied which help to take precautionary measures to check probable losses to the paintings and caves.

Overall removal of dust, dirt, spider nets, etc., has also been carried out from the sculpture in the Cave 6 and elephant figure in front of the right side of the entrance gate of Cave 16. Cleaned sculptures were finally preserved with 1 to 3% polyvinyl acetate solution in toluene.

34. BIBI KA MAQBARA, AURANGABAD, DISTRICT AURANGABAD.—Marble, red stone and plaster of main mausoleum (exterior) of Bibi ka Maqbara has been taken up for the removal of dust, dirt, moss, lichen, etc. A mixture of 1% aqueous solution of each ammonia and non-ionic detergent is being used for the purpose. After washing, 1% solution of sodium pentachlorophenate was sprayed over the dry surface followed by 3% solution of Acrypol-Pin toluene as preservative. A 2% solution of Chloramine-T was used to clean yellow-brown spots from the marble surface. Heavy calcareous deposits on the marble block joints were also removed chemico-mechanically.

35. ELLORA CAVES, ELLORA, DISTRICT AURANGABAD.—Chemical treatment and preservation work of sculptures in Kailash temple of Cave 16, episode from the *Ramayana,* elephants row in right hand side *kirti-stambha* and *dhvaja-stambha* was carried out by using 1 to 3% aqueous solution of ammonia, mixed with little non-ionic detergent like teepol for eradication of dust, dirt and vegetation growth. Zinc-silico-fluoride and sodium pentachlorophenate were sprayed as fungicide followed by 1-3% solution of polyvinyl acetate in toluene as preservatives.

36. GONDESHVAR TEMPLE, SINNAR, DISTRICT NASIK.—In continuation of last year's (*1986-87,* p. 183) a mixture of 3% aqueous ammonia and 1% of non-ionic detergent was employed for eradication of dust, din and vegetation growth. A 3% solution of zinc-silicofluoride was sprayed as fungicide over the thoroughly washed and dried stone surface followed by 3% solution of Acrypol-P in toluene as preservative.

NAGALAND

37. DIMAPUR RUINS, DIMAPUR, DISTRICT TUENSANG.—The monoliths of Dimapur ruins were covered with thick growth of moss and lichen giving shabby, black appearance to the figures. Chemical treatment involved eradication of vegetation growth by dilute solution of ammonia and

non-ionic detergent. Oxalic acid was used to get rid of hard black patches. Zinc-silicofluoride, as fungicide, was sprayed to the cleaned dry surface followed by a coat of solution of polyvinyl acetate in toluene as preservatives.

ORISSA

38. LINGARAJA TEMPLE, BHUBANESWAR, DISTRICT PURI.—Chemical treatment and preservation of sub-shrine 64, which was highly infested with thick growth of moss and lichen, was taken up by gentle brushing with a solution of 2% ammonia and teepol. After thorough washing with water, the dried surfaces were sprayed with zinc-silicofluoride as fungicide, followed by coat of 1% solution of methyl methacrylate in toluene as preservatives.

39. MUKTESVARA TEMPLE, BHUBANESWAR, DISTRICT PURI.—The *deul, jagamohana* and *torana* of the temple were affected by dried vegetation growth like moss and lichens, imparting a black appearance to the entire temple. These dried accretions were removed by gentle brushing with a 2% solution of ammonia and teepol mixture. The loosened accretion was then thoroughly washed off by copious usage of water. An aqueous 1% solution of zinc-silicoflouride was then sprayed over the cleaned surface followed by coat of 1 % methyl methacrylate in toluene as preservatives (pl. LXXVIII).

40. PARASURAMESVARA TEMPLE, BHUBANESWAR, DISTRICT PURI.—The *vimana, jagamohana* and the enclosure wall of the temple were having accretions of thick layers of vegetation growth hiding the original colours of the stones. These accretions were removed by using ammonia-teepol mixture in aqueous medium with soft brushes to loosen the accretions. After thorough washing with water entire structure was given a fungicide coat with 1% aqueous solution of zinc-silicofluoride followed by a preservative coat of 1% solution of methyl methacrylate in toluene.

41. JAGANNATHA TEMPLE, PURI, DISTRICT PURI.—Deplastered area of the *vimana* (eight *pidhas* above the spring level) was taken up for the removal of tenacious lime plaster accretions employing chemico-mechanical techniques. The lime accretions were softened with dilute acetic acid solution and were removed by gentle brushing. The treated surface was further cleaned with 2% solution of teepol for the removal of dust, din, etc.

42. SUN TEMPLE-COMPLEX, KONARAK, DISTRICT PURI.—Chemical treatment for the removal of dried accretions from the plinth of *nata-mandira* of the complex was taken up by using 1% solution of ammonia and teepol mixture. The area was thereafter given a fungicide coat of 1% zinc-silicofluoride followed by preservative coating of 1% methyl methacrylate in toluene.

The *mandapa* which is also covered by the similar accretions, is also being subjected to similar treatment chemically. The work is under progress.

RAJASTHAN

43. KALIKA MATA TEMPLE, CHITTAURGARH, DISTRICT CHITTAURGARH.—The old hard incrustation of lime wash/plaster from *pradakshina-patha,* was subjected to chemico-mechanical cleaning by using dilute solution of oxalic acid and obscure details of beautiful small sculptures and carvings brought to light. The *sikhara* and other portions of the structures of the temple were also subjected to chemical treatment and preservation.

44. CENOTAPH AT SMASHAN GHAT, ADARSH NAGAR, DISTRICT JAIPUR.—The wall paintings inside the two cenotaphs were given preliminary treatment

45. MUGHAL GATE, VIRAT NAGAR, DISTRICT JAIPUR.—The wall paintings in the ceiling of two rooms of the gate were chemically treated and preserved after removal of soot, dust, smoke, etc.

46. PATUWON-KI-HAVELI, JAISALMER, DISTRICT JAISALMER.—Painting on the wooden ceiling and walls of the room of Patuwon-ki-Haveli, depicting different human figures, were subjected to chemical cleaning by using different volatile organic solvents and finally preserved.

47. HARIHARA TEMPLE, OSIAN, DISTRICT JODHPUR.—The portal of the temple was treated chemically.

TAMIL NADU

48. SHORE TEMPLE, MAHABALIPURAM, DISTRICT CHINGLEPUT.—Sculptures on the rear of the Shore temple were badly affected by the saline sea water and vegetation growth. A 3% solution of aqueous ammonia and teepol was used to eradicate vegetation growth. After thorough cleaning of the surfaces, paper pulp treatment was given extensively to extract the soluble salts from inside the structures. The surfaces were then given fungicidal treatment with 3% aqueous sodium pentachlorophenate followed by a coat of 3% solution of polymethyl methacrylate as preservative.

49. BRIHADISVARA TEMPLE, THANJAVUR, DISTRICT THANJAVUR.—Strapping of *nayaka* paintings depicting Vishnu on the western wall and two lady figures in standing posture on eastern wall of the chamber 10 of circumambulatory passage to the main shrine of Brihadisvara temple were success fully carried out by disstacco process. All the *nayaka* paintings were given facing by using thin and thick cloth with 20-25% solution of polyvinyl acetate in toluene. After drying it up, the paintings were stripped off very carefully exposing the underlying Chola paintings which were then subjected to chemical cleaning by using butanol, 2-ethoxy ethanol, rectified spirit, etc. Consolidation wherever necessary was also done by using plaster of Paris, fevicol and thick polyvinyl acetate. Finally, the painting was preserved with 2% solution of polyvinyl acetate (pl. LXXIX).

UTTAR PRADESH

50. TAJ MAHAL, AGRA, DISTRICT AGRA.—The marble surface of the lower and upper arches on the exterior wall of the main cenotaph was covered with dust, dirt, grease, soot and other oily accretions imparting yellowishness to the marble. Clay pack technique was thus employed to remove this superficial accretions restoring the original colour and texture to the marble. The work is in progress.

51. KHUSROBAGH, ALLAHABAD, DISTRICT ALLAHABAD.—Chemical treatment and preservation on the exterior of the surface of Prince Khuaro's tomb remained in progress for the removal of moss and lichen. Four corner *burjis* of the tomb were chemically cleaned by using liquor ammonia teepol. Treated area was finally preserved after application of fungicide. The work is in progress.

52. JAGESWAR GROUP OF TEMPLES, ALMORA, DISTRICT ALMORA.—Eradication of vegetation growth, moss and lichen from the external surface of larger group of temples was carried out by using mixture of aqueous ammonia and teepol. Fungicide treatment was given with 3-5% solution of zinc-silicofluoride followed by a coat of preservative with 3% solution of polyvinyl acetate in toluene. The work is in progress.

53. FORT, JHANSI, DISTRICT JHANSI.—The modern paints from the wall were removed by using mixtures of different organic solvents, such as acetone, benzene, dioxane, etc., followed by 3% solution of zinc-silicofluoride as fungicide. The treated area was preserved by a coat of 3% polyvinyl acetate solution in toluene mixed with fine charcoal powder to match the present colour of the Fort wall.

54. BARA IMAMBARA, LUCKNOW, DISTRICT LUCKNOW.—Chemical cleaning on the top and southern side of main building was carried out successfully for the removal of dried moss and lichen followed by fungicide coating and preservatives. The work is to be completed.

55. RUMI DARWAZA, LUCKNOW, DISTRICT LUCKNOW.—Thick layer of moss and lichen, dust and dirt deposited over Rumi Darwaza was subjected to an elaborate chemical treatment. Vegetation growth was completely eradicated with the help of aqueous ammonia and teepol in varied proportions and than 5% zinc-silicofluoride solution was applied for checking further growth of moss and lichen and finally preserved with 3% solution of polyvinyl acetate in toluene.

WEST BENGAL

56. RASA MANCHA, BISHNUPUR, DISTRICT BANKURA.—Chemical treatment for the removal of black patches of dried moss and lichen was continued from last year's (*1986-87,* p 185) work by using dilute solution of ammonia and non-ionic detergent. Cleaned area was treated with zinc-silicofluoride as fungicide followed by a coat of 4% solution of polyvinyl acetate in toluene as preservatives.

TREATMENT OF EXCAVATED OBJECTS AND MUSEUM EXHIBITS[1]

1. About sixty canvas paintings from Hazarduari palace, Murshidabad, were chemically treated for the removal of old translucent varnish layer by using organic solvents like diacetone alcohol, acetone, cellosolve methyl-ethyl ketone, butyl lactate, morpholine, etc. After cleaning, a fresh coat of mastic varnish was provided to the paintings as preservative. Weak or deteriorated canvas was relined wherever needed. Wooden and intricately carved frames of these paintings were also repaired and the decayed ones replaced with fresh wood which were provided with mould of plaster of Paris, mixed with epoxy resins in appropriately matching designs of carvings. These frames were painted with golden bronze powder in polyvinyl-acetate medium (pl. LXXX).

A number of armoury objects such as swords, spears daggers, iron nets were also chemically treated by using 5% solution of sodium hydroxide. After thorough cleaning, a coat of wax jelly was provided to these objects to check further rusting.

Fifteen silver objects viz. *chelum,* throne, chowki, arains, kamal howda, crown, *thalis* were also chemically treated and preserved.

Eleven number of marble statues were chemically treated by using mud-pack technique. Three chandeliers were also cleaned by using aqueous detergent solution.

About four hundred books from the old library of the same museum were also subjected to fumigation by using para dichlorobenzene in specially prepared fumigation chambers to arrest further insect activities.

2. Fifty-nine silver coins found from exploration were treated with 3% formic acid in water followed by a coat of 2% polyvinyl acetate in toluene as preservative.

Eight brass objects from Shyawada, District Ahmedabad, were also treated with 15-20% alkaline ruchhel salt solution and finally washed with distilled water and 2% polyvinyl acetate in toluene.

3. Two thousand and sixty-one coins from Government Museum, Jodhpur and Bikaner were chemically treated and preserved.

4. Forty-five stone sculptures, inscriptions and iron implements from Government Museums, Bharatpur, Amber, Pali, Ajmer and Virat Nagar were chemically treated and preserved.

5. Insecticidal treatment was given to the exhibits displayed in Government Museum, Jaisalmer and new gallery at Amber (Jaipur).

6. Thirty-six stone bas-reliefs of a cenotaph belonging to one of rulers of Amber were chemically treated and preserved.

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[1]Information from 1 and 8-14, Director (Science) of the Chemistry Branch of the Survey; 2, Department of Archaeology and Museums, Government of Gujarat; 3-7, Department of Archaeology and Museums, Government of Rajasthan; and 15-16, National Research Laboratory for Conservation of Cultural Property, Lucknow.

7. Chemical treatment is in progress to preserve a big-sized Hanuhunkar cannon displayed at Indira Chowk, Dholpur.

8. Thirteen copper coins and fourteen lead coins received from Archaeological Museum, Amaravati, District Guntur, were chemically treated and preserved.

9. One each of copper bowl and billon coin and four copper coins received from Excavation Branch of the Survey, Nagpur were chemically treated and preserved.

10. Fourteen lead coins received from excavation at Ghantasala, District Krishna, Andhra Pradesh, were subjected to chemical treatment and preservation.

11. Two copper-plate grants containing four and seven plates respectively, bearing inscriptions on them with a sealed ring and Nandi symbol, were received from Archaeological, Museum Amaravati for chemical cleaning and preservation.

12. A hoard of two thousand and fifty-seven copper coins received from the Archaeological Museum, Amaravati, were taken up for treatment. Two copper-plate grants containing three plates each with a sealed ring having the legends, *Sri Vishama Siddi* and *Sri Vijaya Siddi,* were returned to Archaeological Museum, Amaravati after chemical cleaning and preservation.

13. One oil painting on canvas which was received from Dy. Superintending Archaeologist for Museums of the Survey, Madras, was chemically treated and preserved. Old yellow varnish was removed with suitable organic solvents. Since the old canvas had become very weak and brittle, relining was also carried out. Finally whole painting was thoroughly cleaned and preserved with varnish. Besides a few photoprints, received from the same office, were also subjected to chemical treatment after removing them their mounts. Brownish appearance and other accretions were bleached with sodium chlorite and formalin solution.

14. Twenty two coins received from the Directorate of Archaeology and Museums, Government of Karnataka were chemically cleaned and preserved during the period under review.

15. One *pata-chitra* received from Sarabhai Foundation, Ahmedabad; twenty-five iron and seventy copper objects from Banaras Hindu University, Varanasi; one iron object from National Institute of Oceanography, Goa; and seven hundred seventy-six leaves of Guru Granth Sahib from Burhanpur Gurudwara, Madhya Pradesh, were chemically treated and preserved.

16. Mural from Sinon Monastery, Sikkim were also chemically restored and preserved.

ANALYSIS AND RESEARCH[1]

1. Chemistry Branch of the Survey carried out in extensive studies in the field of analysis and research under various projects, the details of which are as under:

(i) *Effect of noxious Gases on Marble and sandstone of Taj Mahal, Agra:* Under this project, effect of noxious gases like nitrogen dioxide, nitrogen oxide, etc. is being studied as pollutants on standard samples.

(ii) *Studies regarding binding media in ancient paintings:* Studies are being conducted to ascertain the changes occurred in the nature and strength of different binding media used in paintings in different periods with the help of thin layer chromatography, gas chromatography and Infra-red spectrophotometer.

(iii) *X-Ray diffraction studies* : These studies are of great help to find out the nature and composition of various mineral associated with pigments, pottery sherds and other structural units.

(iv) *Scanning Electron Microscopic studies :* Surface enrichment studies have been conducted and good results were obtained when the samples of marble of various heights and different direction of Taj Mahal, Agra, were studied.

In addition to the above, potsherds, tiles and metal objects were also studied under Scanning Electron Microscope.

(v) *Thermogravimetric and Differential Thermal Analysis* : TG-DTA studies of black potteries have revealed that the firing temperature of these objects must have been in between 300° C to 600° C. Similarly red potteries and other objects are also being studied under this project.

(vi) *Infra-red Spectrophotometric studies* : IR studies of red potteries have shown peaks at 1000 cm^{-1} 1100 cm^{-1} (corresponding to Si-O stretching) and second peak at 850 cm^{-1} (corresponding to Si-F stretching) giving important clues regarding the raw materials used and sites of their occurrence.

2. Air Pollution Laboratory, Agra of the Survey continues to collect data on the various parameters which may affect the monument on account of air pollution. The factors which were studied by the laboratory are Level of SO_2 concentrations and sulphation rate studies by 'Lead Candle method' at Taj and Sikandra, dust fall rate measurements at Taj, Sikandra and Red Fort, Agra, Collection of meteorological parameters and Rain fall studies.

Monitoring of gaseous concentrations was carried out by automatic sulphur dioxide analysers to obtain informations about hourly levels of SO_2 concentration in the atmosphere and to assess the effectiveness of control measures.

3. National Research Laboratory for Conservation of Cultural Property, Lucknow, carried out studies on following Research Projects :

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[1]Information from Director (Science) of the Chemistry Branch of the Survey except the item 3 which was received from National Research Laboratory for Conservation of Cultural Property, Lucknow.

(i) *Study of iron metallurgy in ancient India :* Technical studies of some artifacts from six early Iron Age sites namely, Kausambi, Mahurzhari, Ami, Hulaskhera and Takalghat were completed. Work on the study of technology of Iron tools from another site, Manjhi, Bihar (600 BC) has been started.

(ii) *Conservation of bronze and brass images in India*: A National Project for Conservation of bronze images in India has been started. Under this Project a number of bronze collections from Bihar and West Bengal were examined. Other States will also be covered under the scheme.

To understand the conservation problems of brass and bronze artifacts, some samples of different composition were prepared. Studies on these samples are continuing.

A short -term project entitled "Controlling the Corrosion rate in brass with Inhibitors" has been undertaken. Studies were made with sixteen compounds on the samples prepared from brass strips. The samples were properly prepared, dried and degreased with alcohol and acetone. Experiments were conducted in salt mist chambers with SO_2, CI_2 and H_2S gas.

(iii) *Studies on the Taj Mahal:* Various combinations of lime based mortars and plasters and indigeneous additives like *dal, gur, bel, alsi,* etc. were tested to find out the best combination that can be used as a material for crack filling at the Taj.

In order to assess the role of pollutants from the Mathura Refinery, monitoring of suspended particulate matter was carried out. The s.p.m. thus collected was analysed in the Laboratory for the determination of acidity, sulphate, chloride and calcium Lons. The results obtained were compared with the s.p.m. data obtained at the Taj Mahal.

(iv) *Evaluation of commercial washing powder for stone cleaning* : The project was started to assess the damage caused by the commercial washing powders to stone. The powders were analysed in the Laboratory and the stone samples were kept in contact with the washing powders and their different constituents individually and it was found that the samples in contact with a particular brand of washing powder deteriorated very quickly.

(v) *Study of Microflora of Ajanta wall paintings and their control measures* : In continuation of the previous studies under the above project twenty fungal species were identified which were isolated from wall paintings acroflora, soil/dust of caves. It was found that only some fungal Species and bacteria were commonly present in the air, on the surface of wall paintings and in dust. These are *Acramonium indicum, Atlernaria alternata, Aspergillus flavus, Anidulaus, A. niger A. Terreus, A. Versicolora, Cladasporium Cladosporioides, C. Herbarum, Curuularia lunata, C. Pallescens, Chaetomium globosum, Drechslera Oustrallensis, D. Haurlensis, Emericella nidulaus Espcoccus nigram, Fusarium Oxysporum, F. Moniliformal, F. Olani, Macrophorina pleaseolina, Mycelia storilia, Paecilomyces varioti, Rhizopus rigricans, Stachybotrys atra. Trichoderma herzianum,* and bacteria.

Efficacy of fungicide, *orthophenyl phenol* and ***P****-chloro-m-cresol* was tested. The species growth of *Aspengillus* and E. *moniliformac* were checked at 0.01% and the growth of *C.JLunoa, C. pallecens* was checked at 0.008%, *A. alternate, D. hawilensis andD. australiensis* at 0.006% of *P-chlora-m-cresol.*

The efficacy of *orthophenyl phenol* against the above listed fungal species showed complete inhibition of *A. niger* at 0.01%, *A. Nidulans* and *A.terreus* at 0.02%, the rest were completely checked at 0.006%.

(vi) *Study of foxing marks on paper:* SEM studies were done at the National Botanical Research Institute, Lucknow for the brown foxed spots collected from 1931, 1952 and 1954 edition books. All the spots showed fungal spots. There seems a strong possibility that the 'foxing' marks are on account of fungal development.

(vii) *Control of furniture carpet beetle* (*Anthrunus sp.*)*:* Para di-chlorobenzene and DDVP were tested for the control of carpet beetle. It was observed that 13.5 gm of PDB was totally consumed in a week's time in a 1.5 cubic metre fumigation chamber which was quite effective to kill the insects.

While studying with DDVP, 1% was found to be effective for killing the beeties. It does not change the hue and texture of the wool as well.

(viii) *Discolouration of Taj Mahal Marble-Detection of organic coating* : Inorganic analysis of the samples collected from yellowish dirty accretions and patches could not yield good results, which in turn led to the thought of presence of some organic coating that might have been applied to the monuments in the past. To ascertain this the present study had been carried out.

Samples were taken from 35 spots from different areas of the monument. Extracts were analysed by infra-red spectro-photometry, using specular reflectance technique. Apart from these, Infra-red spectra of the reference materials e.g. polymerised methyl methacrylate, perspex sheet (a polymethyl methacrylate preparation), polyvinyl acetate, paraffin wax and some other resins available in the Laboratory were recorded.

It was seen that infra-red spectra of the samples from the Taj Mahal matched exactly with the spectra of polymethyl methacrylate or the solution of 'perspex' which is an acrylic resin. Out of the 35 samples which were taken from different parts of the monuments, 20 gave positive results.

Detailed results are documented in the Laboratory's report *Studies on Materials of Taj Mahal.* The work is also published as research paper entitled "Discolouration of Taj Mahal Marble-A case study" in the preprints of the ICOM Committee on Conservation Meeting held at Sydeny during September, 1987.

(ix) *Studies on the characterization and identification of Natural resins occurring in the cultural objects with particular reference to Ajanta wall paintings* : Natural resins have been used by artists as protective coatings, adhesives, paint media, since antiquity. Natural resins have a tendency to yellow and become brittle with age, thus arises a need of their characterization and identification for the proper conservation of cultural objects. With this idea, the present study was undertaken.

As a first step, the analysis of fresh/partially aged natural resins e.g. *chandrus, sal*-dammer, *Rumimastik* Rosin, Gugal and shellac by thin layer chromatography was done. The purified form of these six resins were coated on 4" x 4" glass sheets in the concentration of 1-3%. The samples for analysis were taken from 1 sq cm area of the specimens.

The analysis was carried out by thin layer chromatography. In all 29 solvent systems with silica gel adsorbent and antimony (III) chloride as a detection reagent were found suitable for the analysis of the six natural resins: Petroleum ether (60-80)° - ethyl formateformic acid (93+15+1); Petroleum ether (60-80)° - ethyl acetate-toluene (80+15+5); and ethyl acetate-n hexcne (30+70).

The results of this study have been communicated for publication in the International Journal—*Journal of Chromatography,* Elsevier, Amsterdom under the title “Thin layer chroma-tographic analysis of some Indian natural resins occurring in the objects of art”.

(x) *The study of the Indian Exudate plant gums in their artistic applications* : Gums have been important in art as a principal media for ‘water colours’ miniatures, wall paintings and for manuscript illumination. Analysis of gums will shed light on the technology of the paintings which is also helpful in selecting proper methods of conservation.

Plant gums is a polysaccharides, which on acidic hydrolysis gives monosaccharides. Therefore the separation and identification of monosaccharides by thin layer of chromatography individually as well as in mixture has been taken up as a first step. The work done during the period under report is as follows: Various sugars or monosaccharides were subjected to analysis by thin layer chromatography. In all 33 solvent systems with various adsorbents like Silica gel, Silica gel+Kiselguhr 4, Silica gel buffered with boric acid, Silica gel buffered with sodium acetate, Silicagel buffered with sodium phosphate, Silica gel buffered with sodium bisulphite, Silica gel APTLC plate, Kieselguhr G buffered with sodium acetate, Cellulose and Cellulose buffered with sodium fungstate and various detection spray reagents were selected on the theoretical and logical approach from the reported literature and taken for the TLC analysis of sugars and sugar acids. Out of which, 17 solvent system with various types of silica gel adsorbent were tried so far. Further work is in progress.

(xi) *Study of the fundamental properties of birch bark preservation technique*: In continu-ation of the study of evaluation of birch bark, further investigations were carried out by covering different technical aspects. Under the study of the above project, birch bark samples were tested before and after application of the different adhesives varying in their concentration. The adhesives specially used for the experimental study were methyl cellulose, carboxy methyl cellulose, commercial glue, polyvinyl acetate and polyvinyl alcohol.

By using the above adhesives, the significant tests like folding endurance and brightness were done before and after artificial ageing.

The effect of the adhesives was noted, particularly on the separation of thin layers of bark, its physical strength, change into the original colour and on the sticking property of bark.

(xii) *Study of the methods of preservation of palm-leaf:* Taking into consideration the nature and extent of deterioration of palm-leaf manuscripts, this project was undertaken to carry out the extensive study of evaluation of palm-leaf.

Under the project preliminary observations like nature of material, its appearance or colour, length, width of palm-leaf, density and thickness and determination of moisture content, percentages of water absorption, pH and acid content were studied.

Extraction of palm-leaf was done by using organic solvents like acetone, alcohol, toluene, carbon terta chloride benzene, ether, chloroform and xylene.

Percentages of soluble matter was determined in water organic solvents (as above) and alkalies. Effect of mild acids was also seen on palm-leaf.

Among the analytical study, the percentages of lignin, cellulose and silica were determined. The reducing groups like keto, aldehyde and carboxyl were collectively measured by using copper number method.

Further investigations of extractives and ash content is under progress.

(xiii) *Conservation of Hukuru Mosque at Male, Maldives* : The Laboratory, conducted various types of studies on the coral stones, the building material of the Hukuru mosque. Samples were tested for determination of the nature of stone. The tests included water absorption by total immersion, rate of water evaporation and absorption of moisture from the atmosphere. The porosity of the samples was determined by hydrostatic weighing paraffin method and mercury weighing.

The mosque was examined inside and outside for biological problems. Samples of blue green layers of algae were collected and cultured on traditional nutritive algal media. It was found that blue green algae was scytonema sp belonging to the order *chlorococcales* and *volvocales.* Experiments were performed to find a suitable algaecide for treatment. The border of the painted wooden Mehrab was found soft at some places and at some areas were having fungal patches with green and dark brown knots. Samples were collected with non-destructive methods and cultured on Mycological nutritive agar media. The fungus identified was *Memnoneilla eclionulata, Penicillumfuniculosum* and *chaetomium globosum.* It was successfully treated with a fungicide.

XII. ARCHAEOLOGICAL GARDENS[1]

ANDHRA PRADESH

1. HILL-TOP ISLAND GARDEN, NAGARJUNAKONDA, DISTRICT GUNTUR.—The garden around the Buddhist monuments was well-maintained by planting trees and shrubs in spite of the rocky terrain.

GOA

2. CHURCH GARDENS, VELHA GOA, DISTRICT GOA.—Sprinkler system has been introduced in order to maintain the gardens presentable, especially during summer.

GUJARAT

3. MONUMENTS, LAVANA (KALESHWARI), DISTRICT PANCHMAHALS.—Laying out of garden around the monuments was completed.

4. GEBANSHA'S STEP WELL, CHAMPANER, DISTRICT VADODARA.—The work of laying out the garden around the monument was completed.

5. MONUMENTS, SANT, DISTRICT VADODARA.—Layout was done to beautify the gardens around the monuments.

KARNATAKA

6. AIHOLE GARDENS, BIJAPUR, DISTRICT BIJAPUR.—The existing gardens were kept in a good condition. To solve the problem of scarcity of water and also to extend the garden by new plantations, two borewells were sunk.

7. ASAR MAHAL, BIJAPUR, DISTRICT BIJAPUR.—New plants were introduced in the garden.

8. AMRUTESVARA TEMPLE, AMRUTAPUR, DISTRICT CHIKKAMAGALUR.—Wild vegetation was cleared off from the area, submersible pumpset was installed and pipelines were laid to develop the garden.

9. JAINA AND KEDARESHVARA TEMPLE, HALEBIDU, DISTRICT HASSAN.—Two submersible pumpsets were installed in the newly-sunk borewell for supply of water to the existing garden and to complete landscaping around the temple.

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[1]Information from : 3-5, Department of Archaeology and Museums, Government of Gujarat; 14, Department of Archaeology and Museums, Rajasthan; 13, Chandigarh Circle of the Survey; and ihe rest from the Chief Horticulturist of the Survey.

10. DARIA DAULAT BAGH, SRIRANGAPATNA, DISTRICT MANDVA.—The work of returfication of lawns, recharging of fountains and removal of wild vegetation was completed from the palace area.

MAHARASHTRA

11. BIBI-KA MAQBARA, AURANGABAD, DISTRICT AURANGABAD.—The garden was maintained properly by planting mango trees in place of the dried ones. Cypres plantation along the water ways was maintained.

ORISSA

12. SUN TEMPLE, KONARAK, DISTRICT PURI.—With a view to improving the environment and also to check the saline winds from the seaside varieties of trees and plants were planted around the monument. Irrigational facilities are being provided by laying pipe-lines.

PUNJAB

13. TOMBS OF MUHAMMAD MOMIN AND HAJI JAMAL, NAKODAR, DISTRICT JALANDHAR.—A garden was developed the area around the monuments.

RAJASTHAN

14. MONUMENTS AT AMBER, DISTRICT JAIPUR.—The garden at the Mohan Bari was properly maintained and the work of laying out a garden around Raja Bharmal-ki-chhatri is in progress.

TAMIL NADU

15. BRIHADISVARA TEMPLE, GANGAIKONDACHOLAPURAM, DISTRICT TIRUCHIRAPALLI.—The work of developing garden suiting the environment and planting variety of trees has been completed.

UTTAR PRADESH

16. AKBAR'S TOMB, SIKANDARA, DISTRICT AGRA.—The work of realignment of the PVC pipe-line in the eastern sector of the garden was completed.

17. SABRI FORT, JAUNPUR, DISTRICT JAUNPUR.—Site was taken over for development of a garden.

18. FORT, JHANSI, DISTRICT JHANSI.—Landscaping of the inner portions of the fort was taken up and pipe-lines were laid.

19. SIKANDAR BAGH, LUCKNOW, DISTRICT LUCKNOW.—Development of the garden under phase I was completed.

WEST BENGAL

20. KALA CHAND TEMPLE AND RASA MANCHA, BISHNUPUR, DISTRICT BANKURA.—The development of the garden and the installation of pumping set has been completed.

21. HAZARDUARI PALACE, MURSHIDABAD, DISTRICT MURSHIDABAD.—A pumpset was installed and pipe-line was laid for irrigation purposes. The garden work is in progress.

XIII. PUBLICATIONS

PUBLICATIONS OF THE SURVEY

1. ANNUAL REPORT ON INDIAN EPIGRAPHY.—The issues for the year *1976-77,1978-79, 1980-81* and Subjects Index were brought out.

2. EPIGRAPHIA INDICA.—Volumes XXIX to XXXIV were published.

3. EPIGRAPHIA INDICA—ARABIC AND PERSIAN SUPPLEMENT.—Twelve volumes from *1913-20* to *1970-71* have been reprinted.

4. INDIAN ARCHAEOLOGY—A REVIEW.—The issue for the year *1984-85* was brought out and the issue for *1985-86* was sent to the press.

5. GUIDE BOOKS.—Four guide books, on *old Goa, Nagarjunakonda, Khajuraho* and *Rajgir* were reprinted.

6. MEMOIRS OF THE ARCHAEOLOGICAL SURVEY OF INDIA.—The report on *Excavations at Surkotada and explorations in Kutch* as Memoir no. 87 was sent to the press.

7. ARCHITECTURAL SURVEY SERIES.—Number 4 and 5 *Temples of Pratihara Period in Central India* and *Temples of Khajuraho* respectively were sent to the press.

8. MANUAL OF THE ARCHAEOLOGICAL SURVEY OF INDIA.—Volume I was published.

9. PICTURE POSTCARDS.—Ten sets of coloured picture postcards which include monuments in Assam, Bhubaneswar, Dig, Konarak, Kashmir, Ladakh, Mandu, Mahabalipuram, Thanjavur and Velha Goa were printed.

OTHER PUBLICATIONS

ANDHRA PRADESH.—The Directorate of Archaeology and Museums, Andhra Pradesh, brought out the following publications during the year under review: (i) *Kuchelopakhyanam,* (ii) *Swatantra Samaramlo Andhra Mahilalu* in Telugu, and (iii) *V.J. Museum, Vijayawada Centenary Souvenir.*

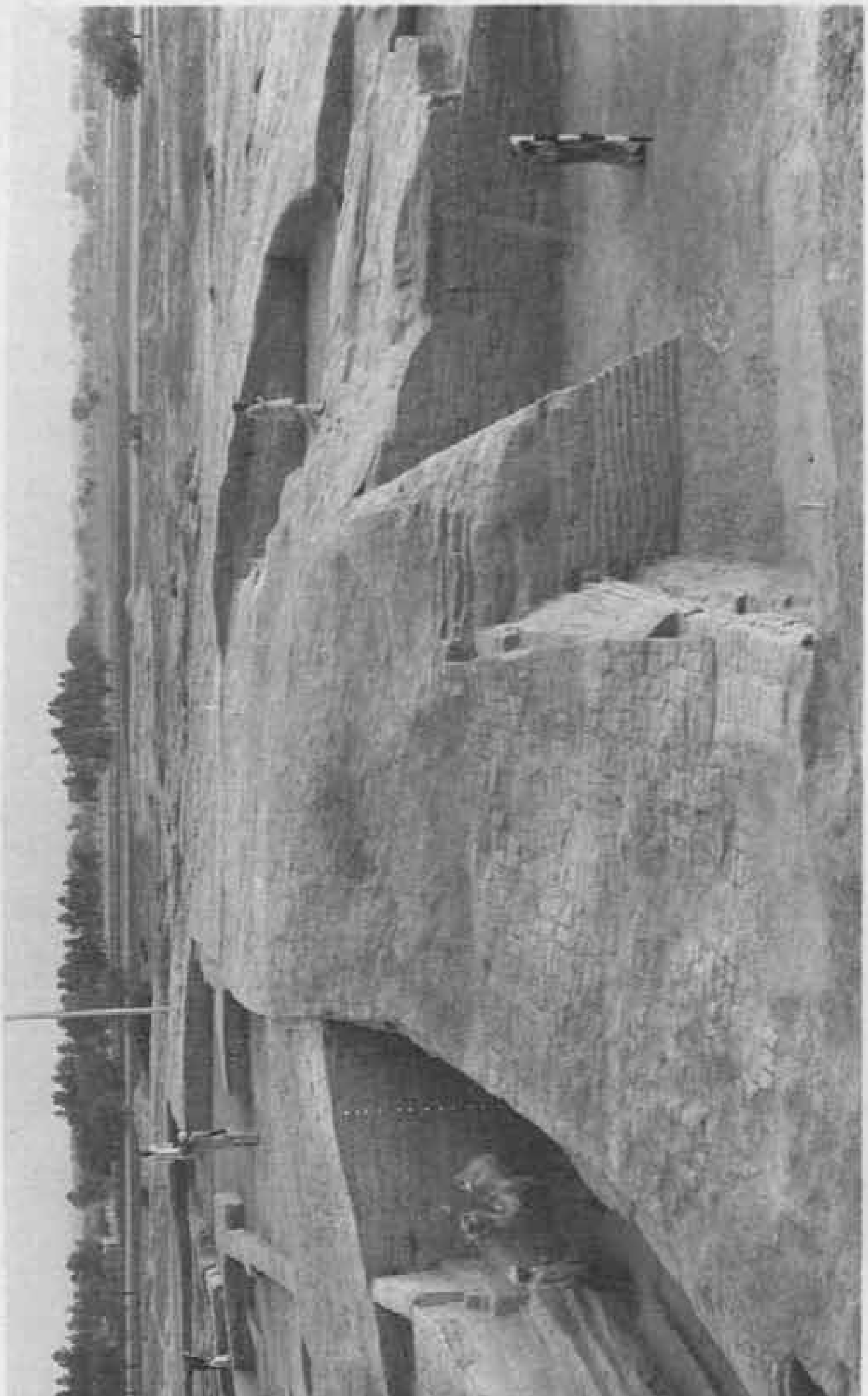
GUJARAT.—The Department of Archaeology, Gujarat, brought out a bilingual folder on the State-protected monument Kera Siva Temple at Kera in District Kutch, and folders on the birth-place of Mahatma Gandhi at Porbandar and Kasturbanu-Ghar at Porbandar. A calendar with photographs of monuments was also published.

KARNATAKA.—The Directorate of Archaeology and Museums, Karnataka, published *Index to Epigraphia Carnatica,* Part-II, and *Keladi Nayaka Architecture and Art,* Vol. V, Part II.

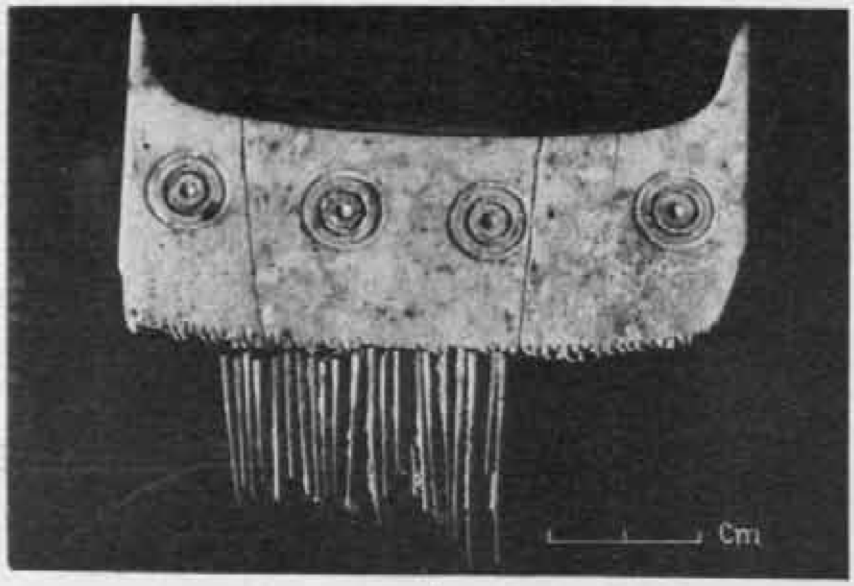
RAJASTHAN.—The Department of Archaeology and Museums, Rajasthan, made press-ready "*The Researcher*", the official bulletin of the Department and brought out pamphlets and booklets pertaining to exhibited objects.



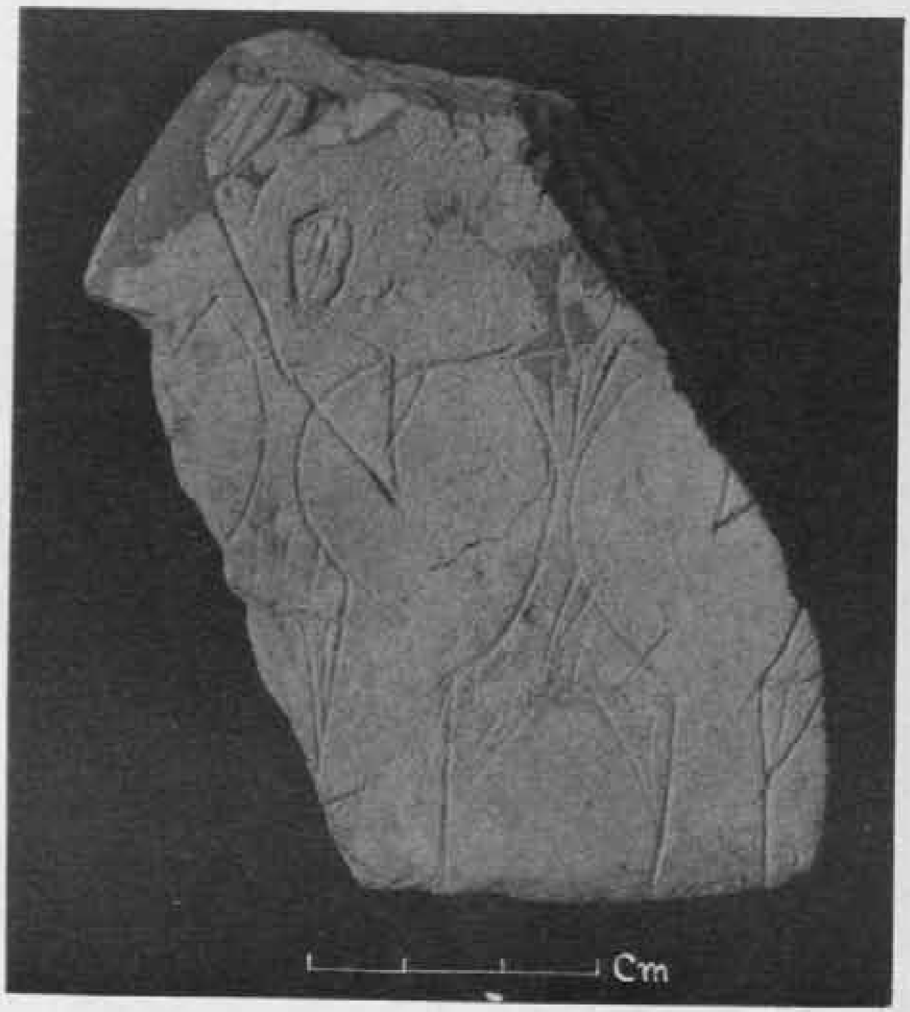
Banawali : exposed pre-Harappan and Harappan defences and other structural phases; view from north. *See p. 23*



Banawali : fortification wall with projections. *See p. 25*



A

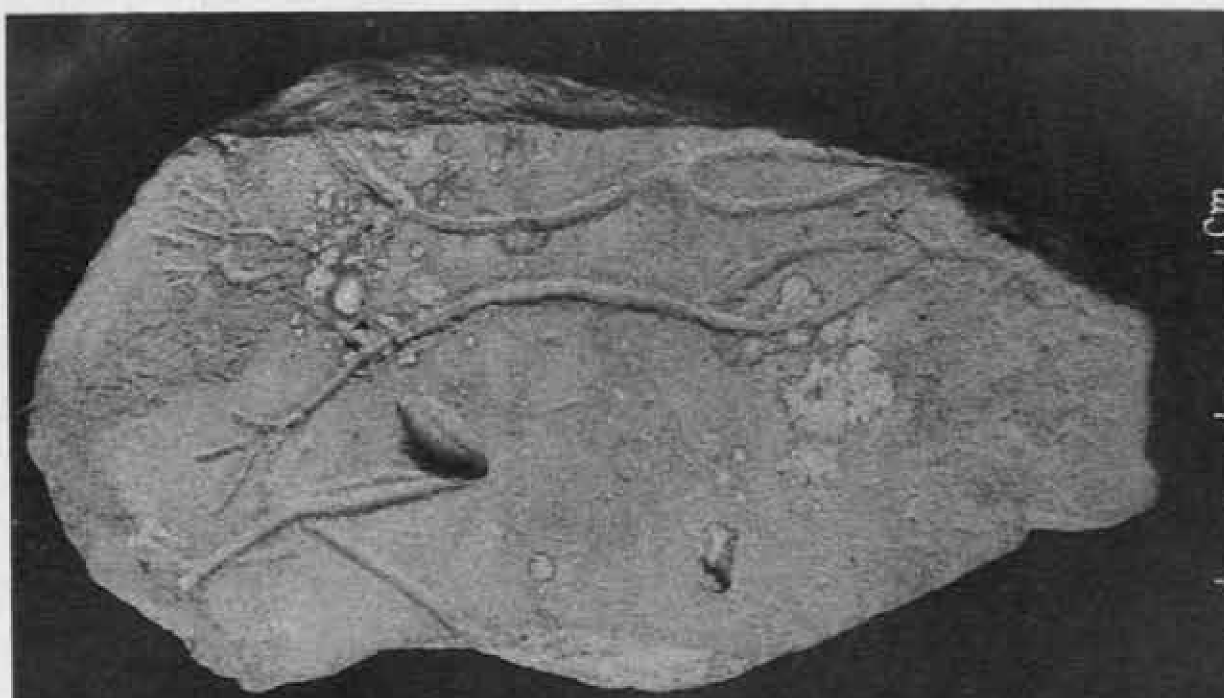


B

Banawali : A, *ivory comb* ; B, *terracotta cake with engraved human figure, Period II. See p. 27*

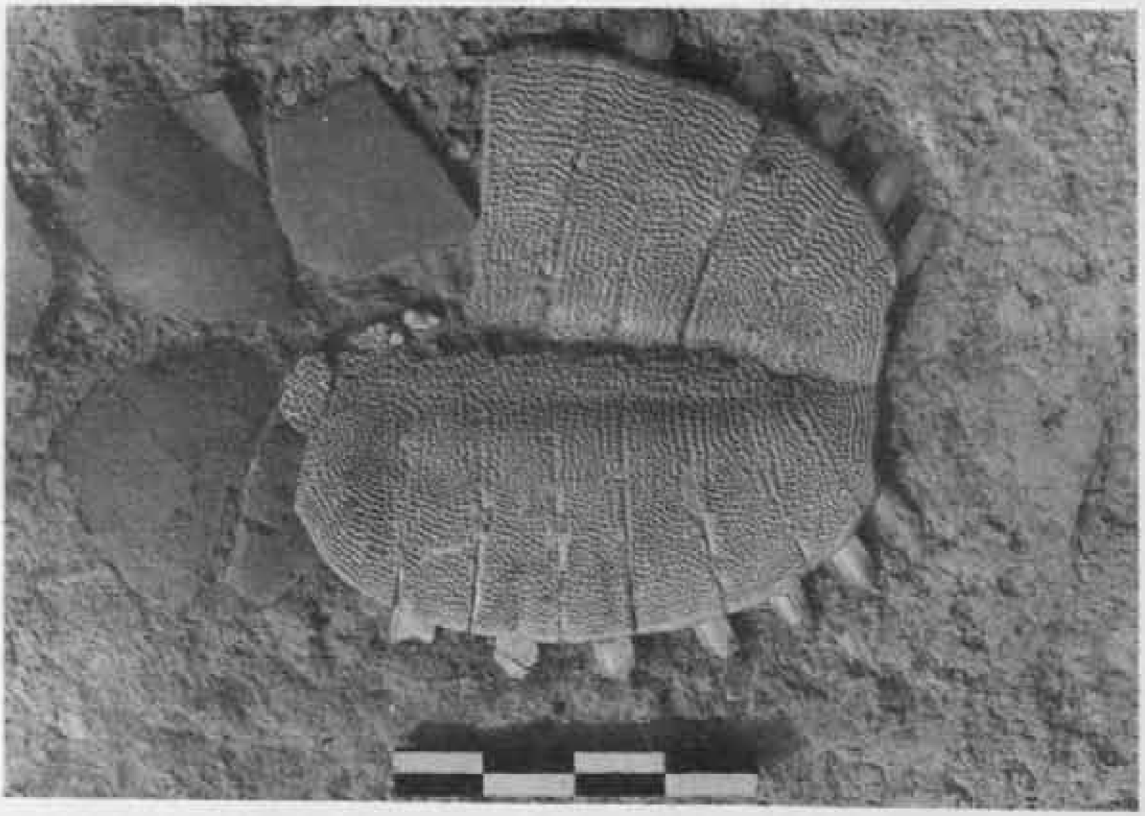


B



A

Banawali : A, terracotta cake with engraved human figure and, B, with incised ass figure, Period II. See p. 27



A



B

Banawali : A, *tortoise shell, Period II*; B, *pot containing weight, beads and small pebbles, Period III. See p. 27*

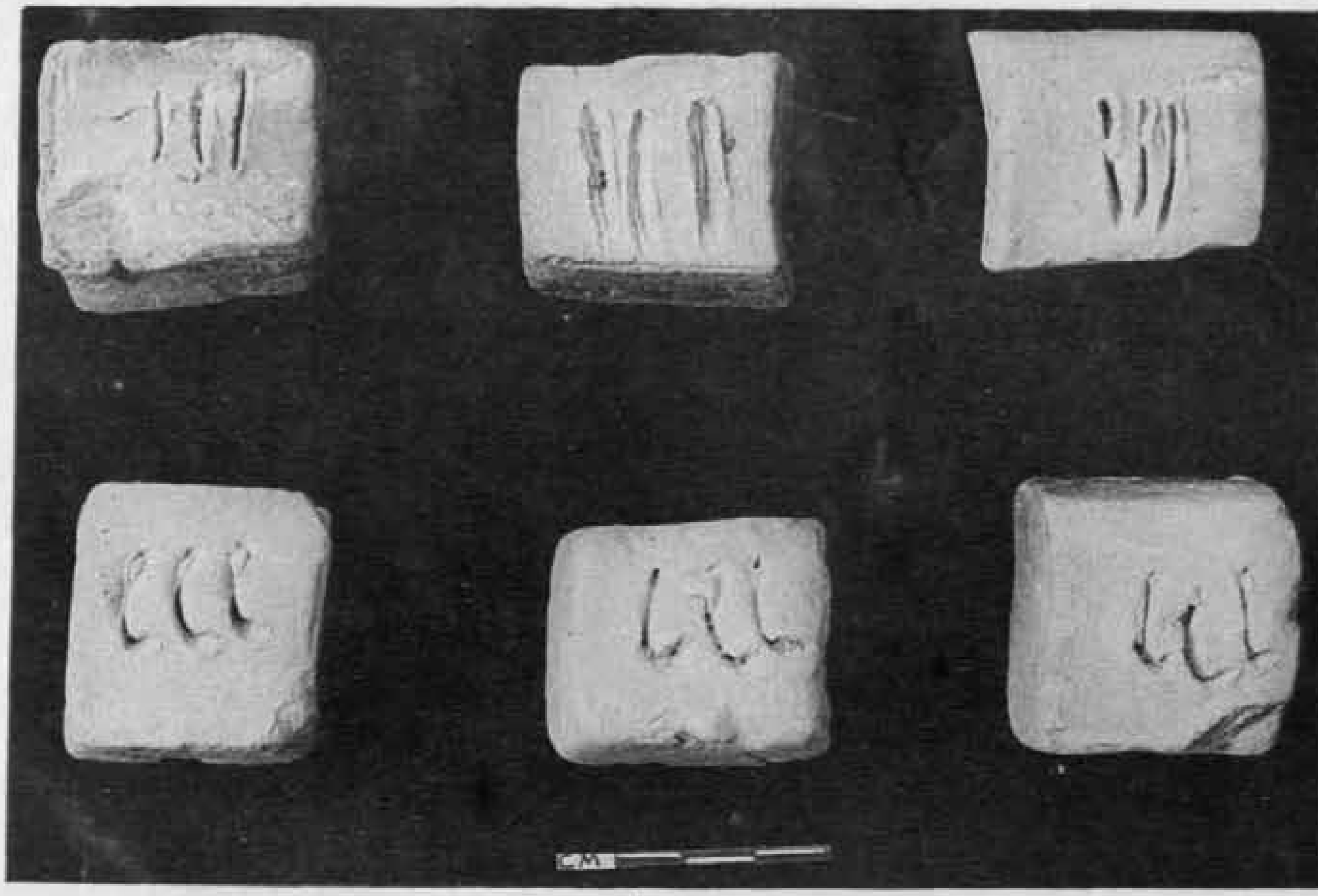


A



B

Thanesar : A, *terracotta sealing, and* B, *plaque, Kushana period.* *See p. 29*



A



B

Thanesar : A, *terracotta tablets, post Kushana (?)*; B, *cast of human head from terracotta mould, Gupta period.* *See p. 29*



A



B

Thanesar : A, *fragmentary stone inscription, Vardhana period* ;
B, *bronze* (?) *vase, Rajput period. See p. 29*



A



B

Thanesar : A, *wall of a house complex* ; B, *an arched structure, Mughal period*. *See p. 30*

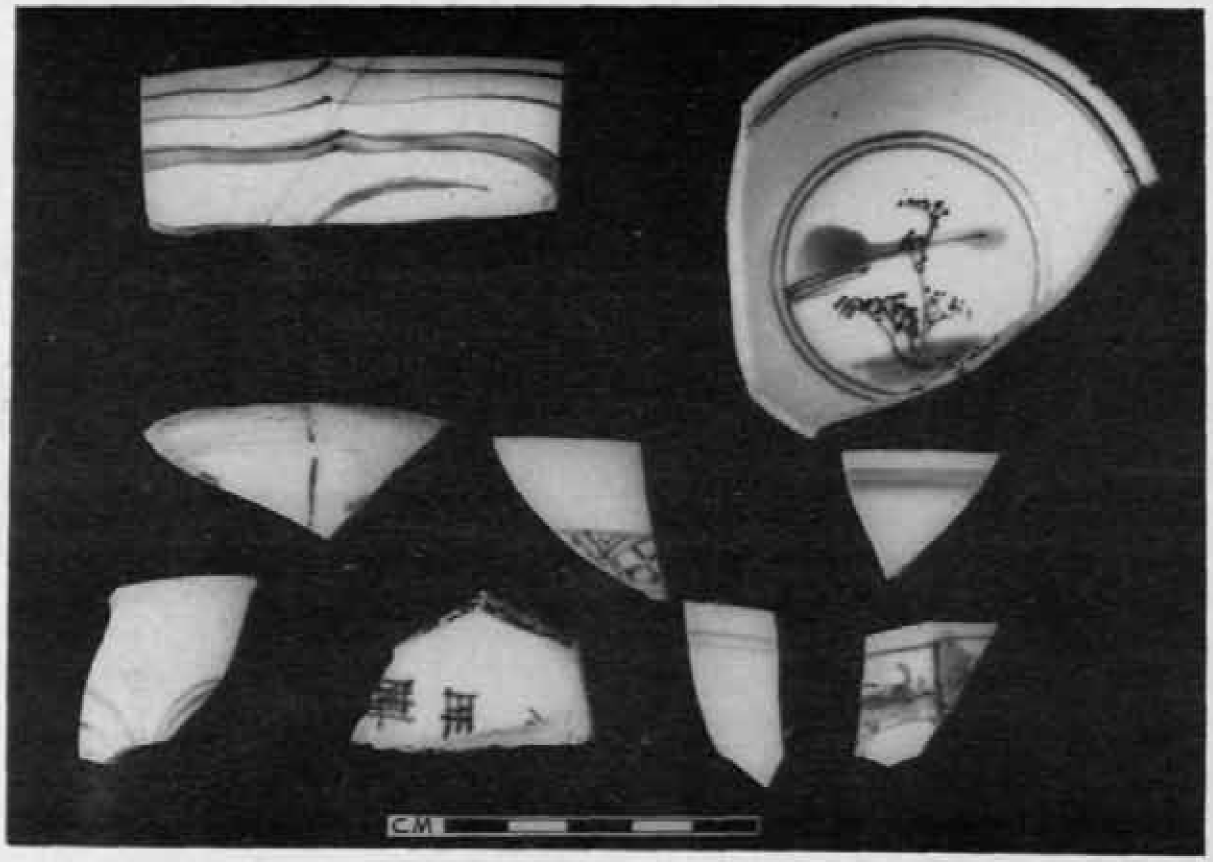


A



B

Thanesar : A, *decorated pottery* ; B, *surahi, Mughal period. See p. 30*

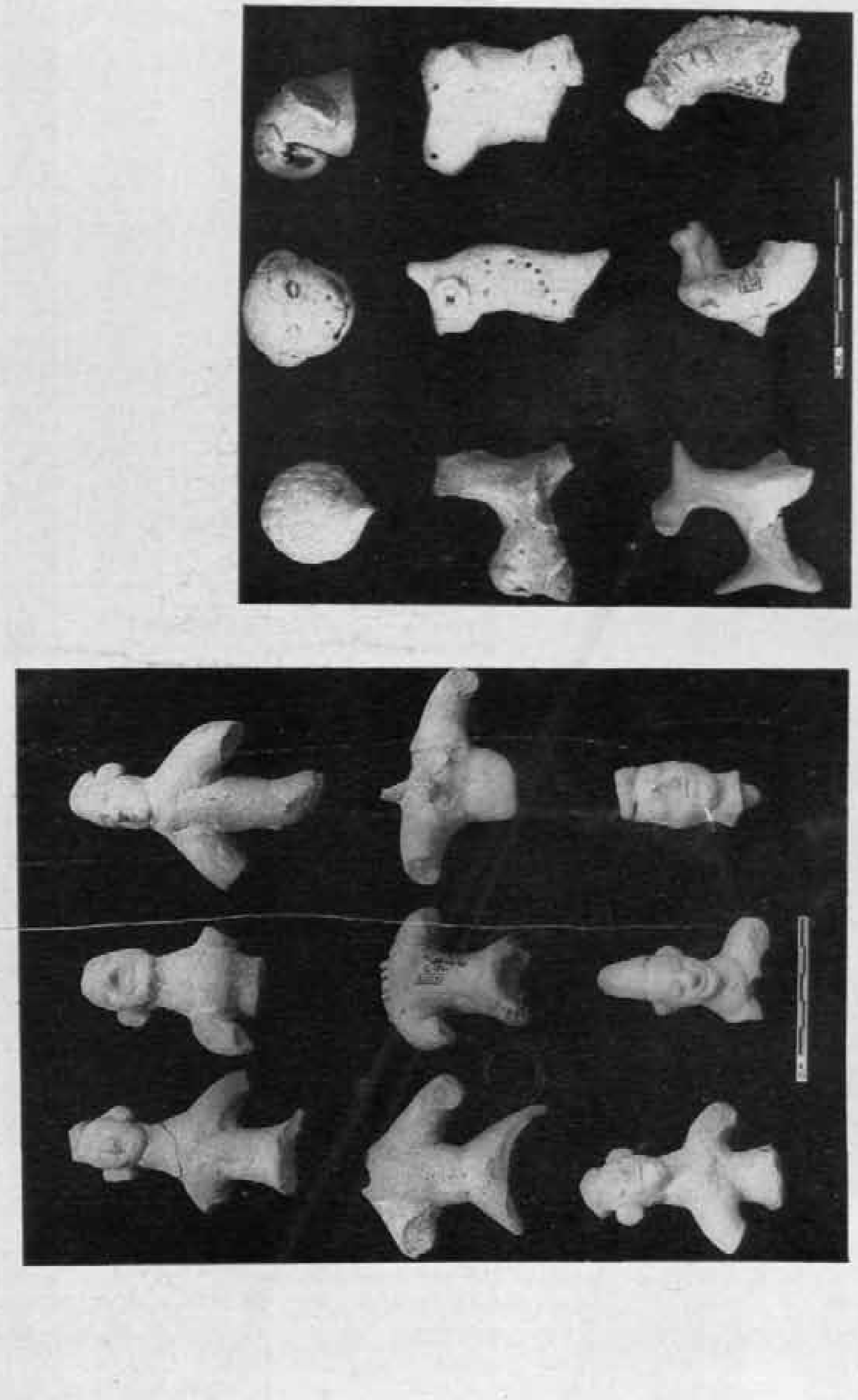


A



B

Thanesar : A, *Chinese porcelain* ; B, *terracotta seal and its impressions, Mughal period.* *See p. 30*



A B

Thanesar : terracotta, A, human and, B, animal figurines, Mughal period. *See p. 30*

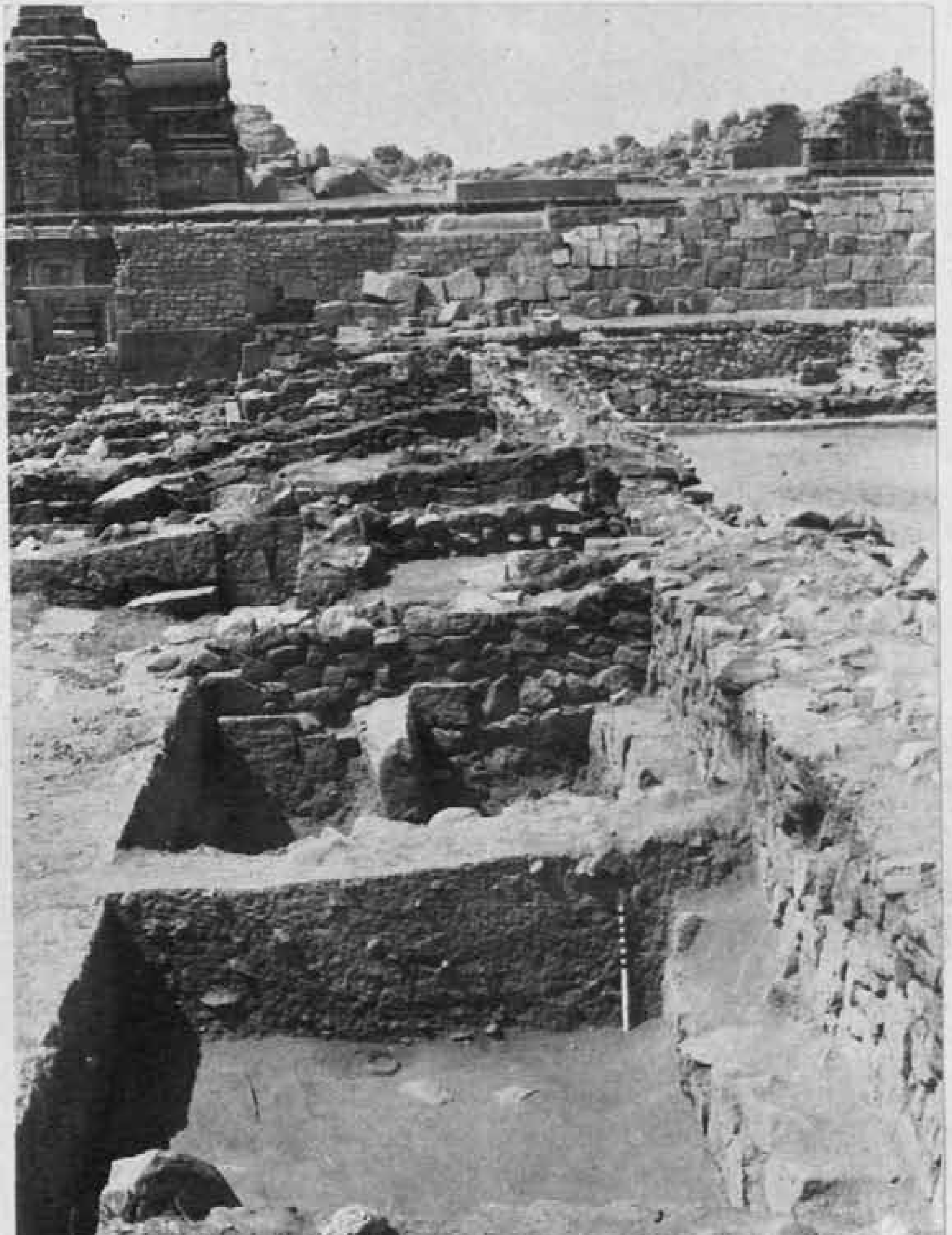


A

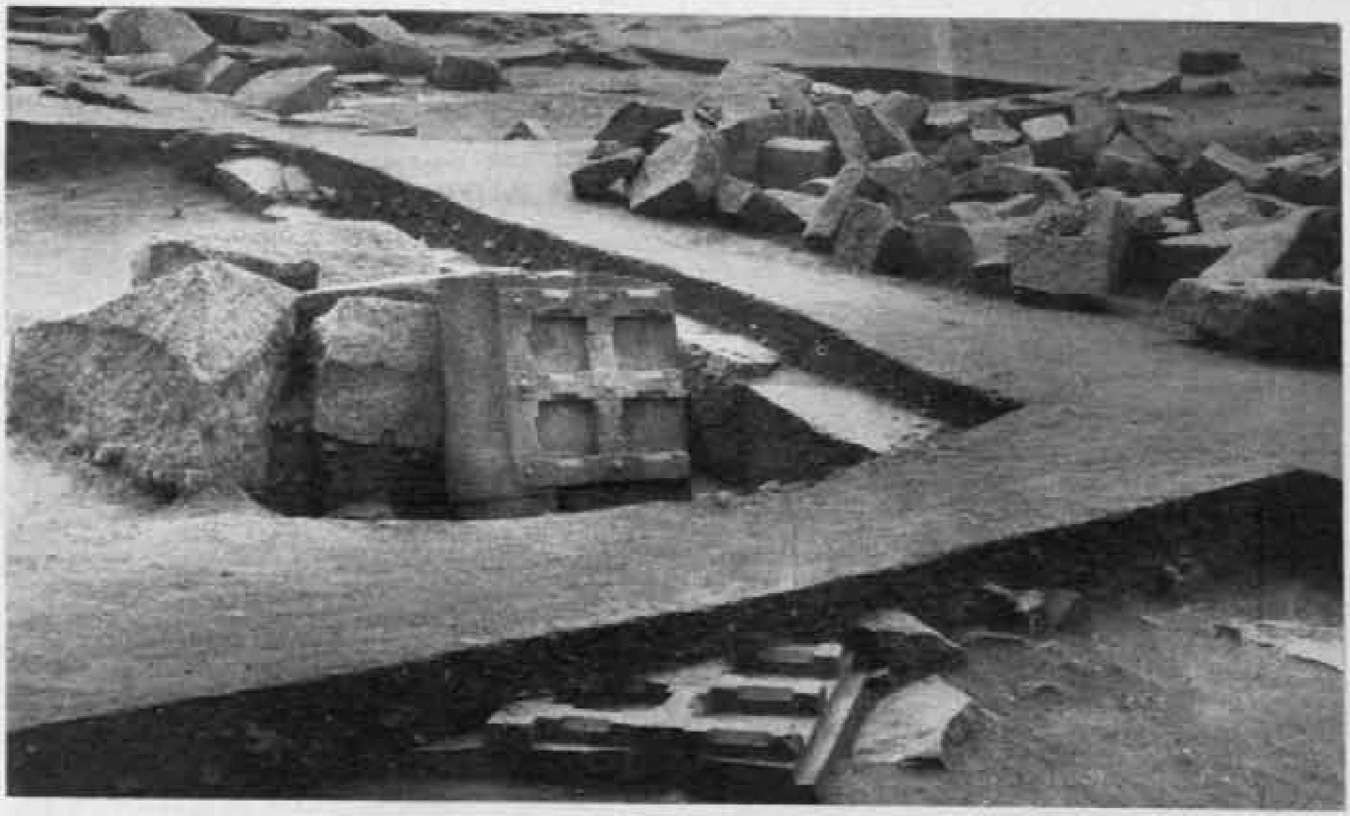


B

Thanesar : A, *partly exposed bastion on the north-western corner* ; B, *defence wall with bastion, Mughal period.* *See p. 30*



Hampi : excavated remains to south of Hazara Rama temple. See p. 34

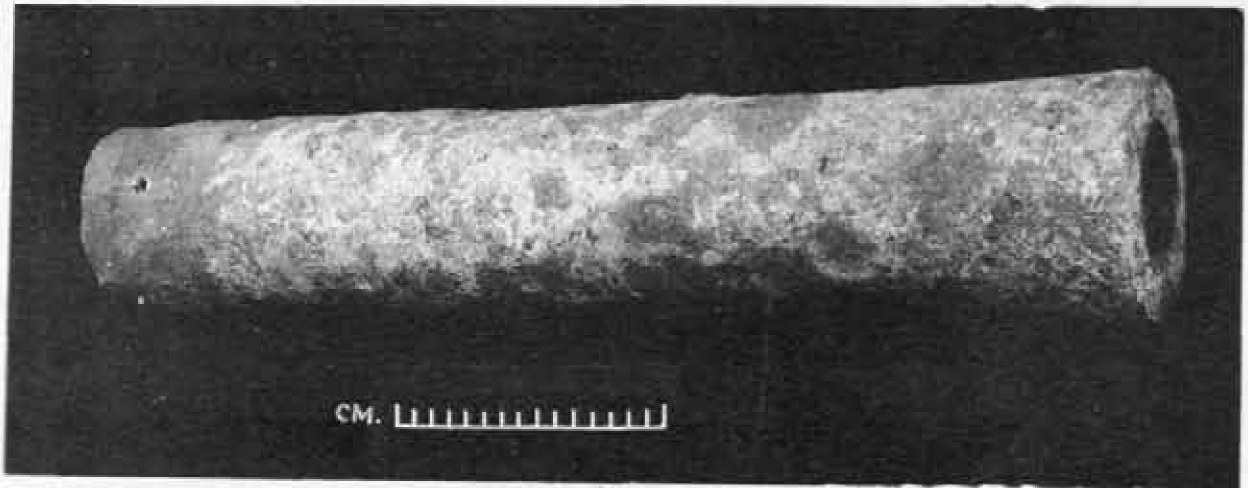


A



B

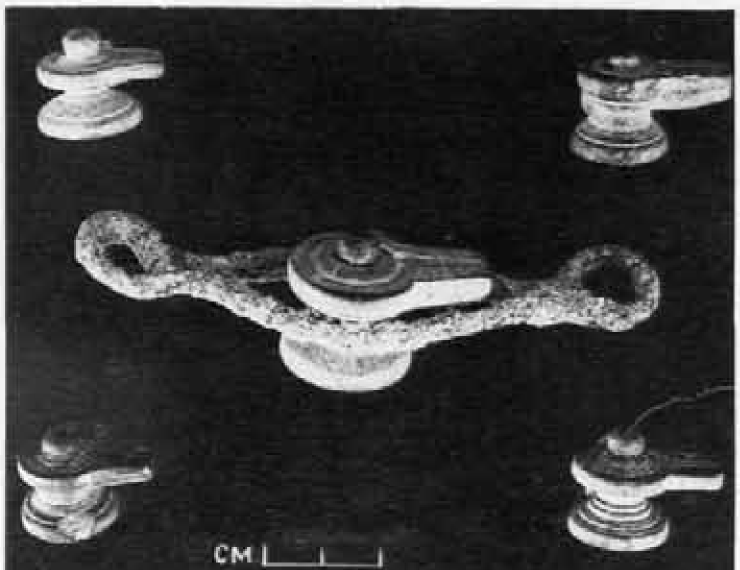
Hampi : carved stone doors in situ. *See p. 34*



A



B

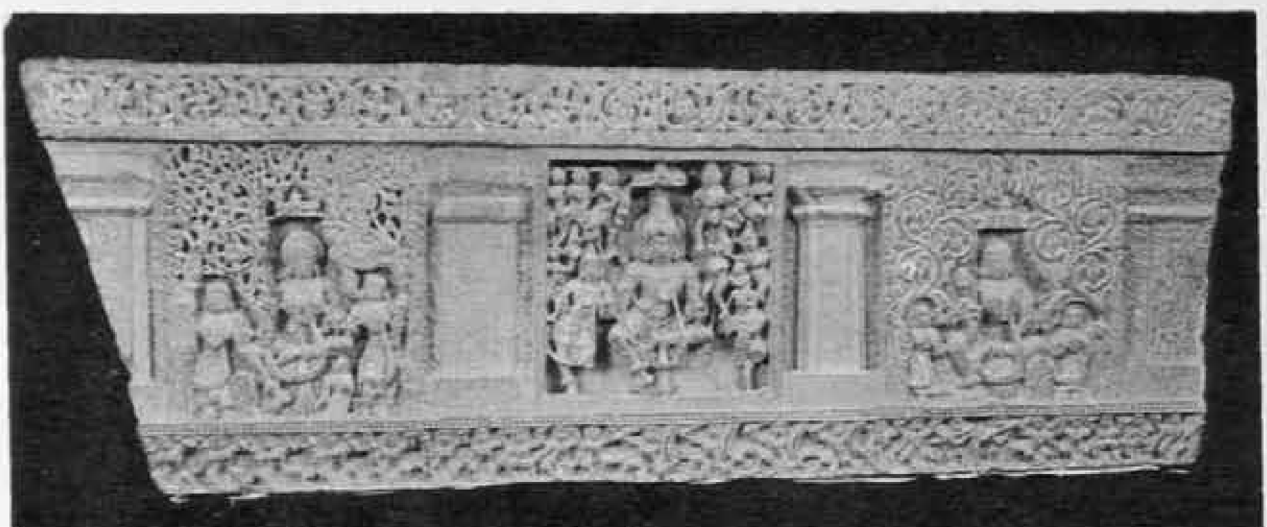


C

Hampi : A, *iron mortar* ; B, *gold objects*;
C, *Siva-lingas*. *See p. 36*



A



B

Hampi : A, *Garuda head*; B, *carved stone panel.* *See p. 36*



A

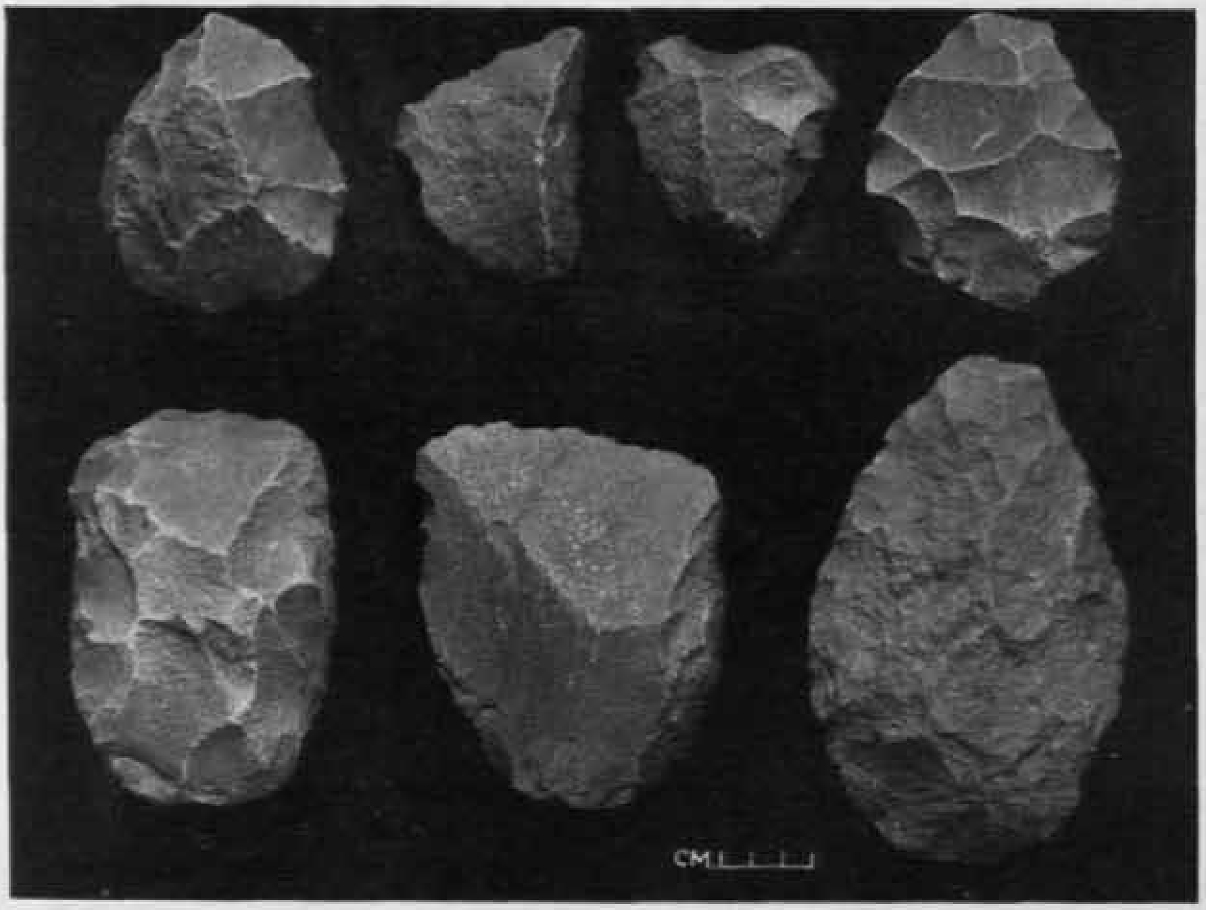


B

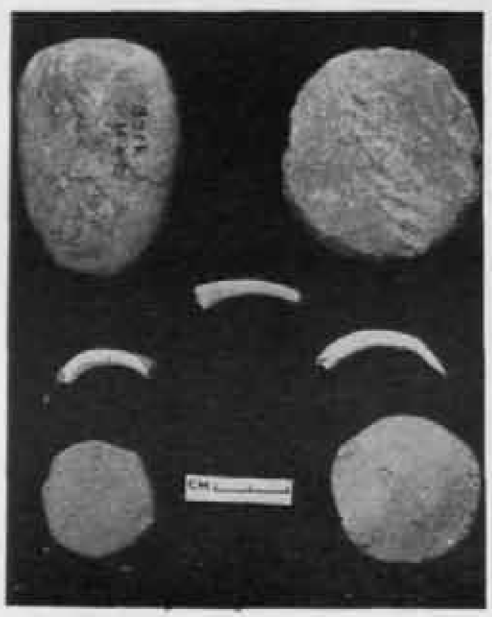


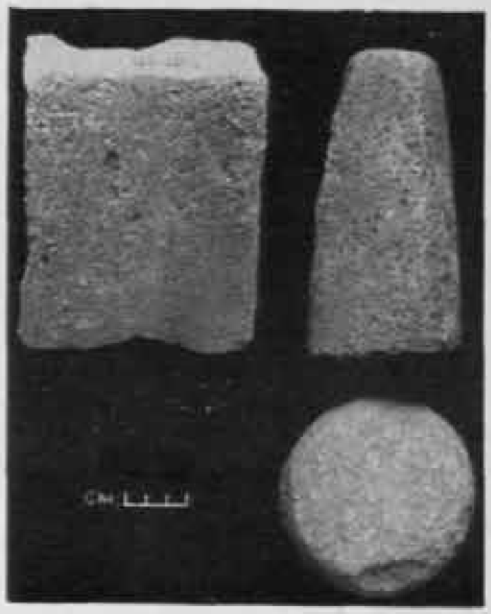
C

A and B, *Hampi : gold necklace and Chinese porcelain with inscription;*
C, *Sannati : inscribed memorial pillars.* *See pp. 36 and 38*



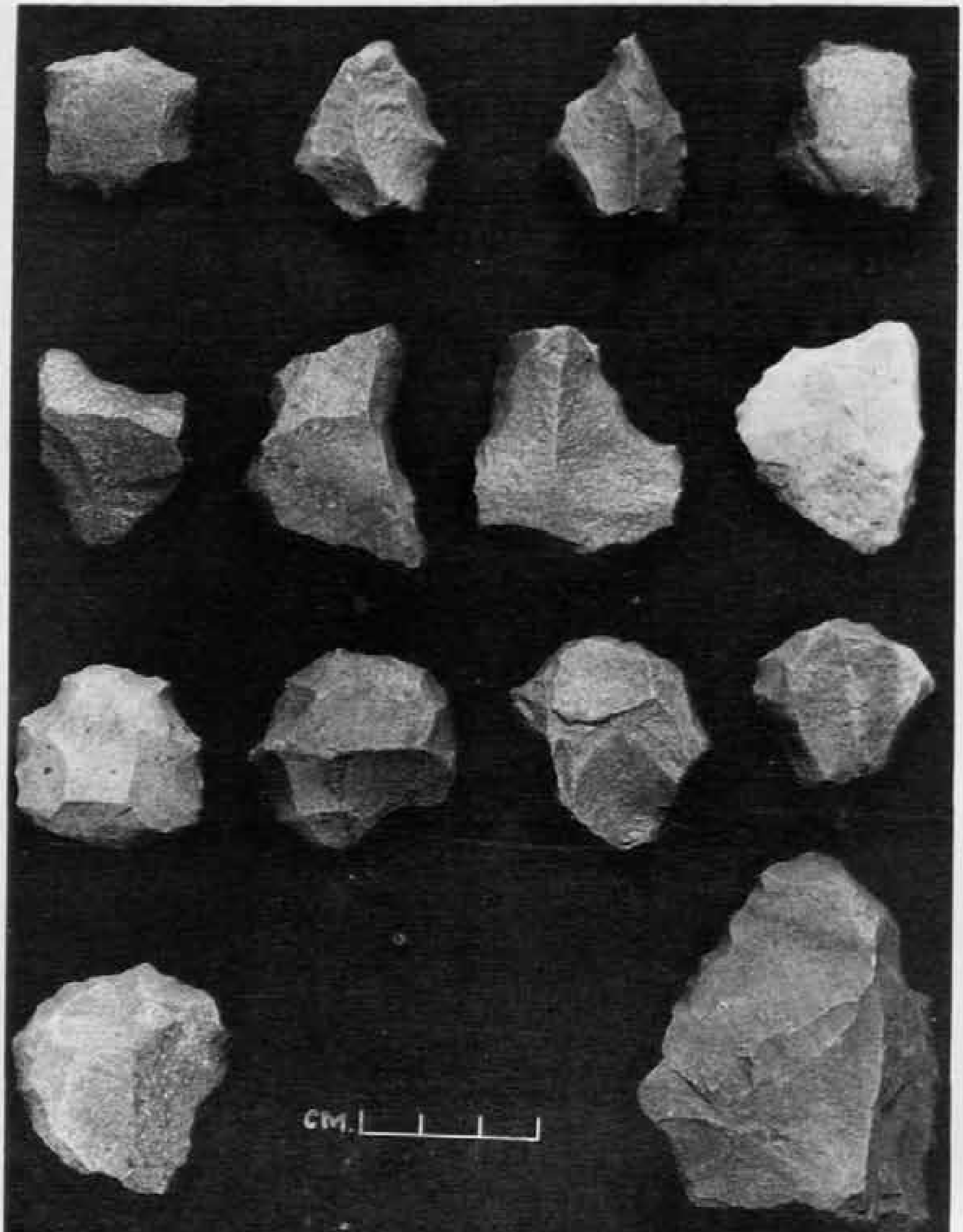
A



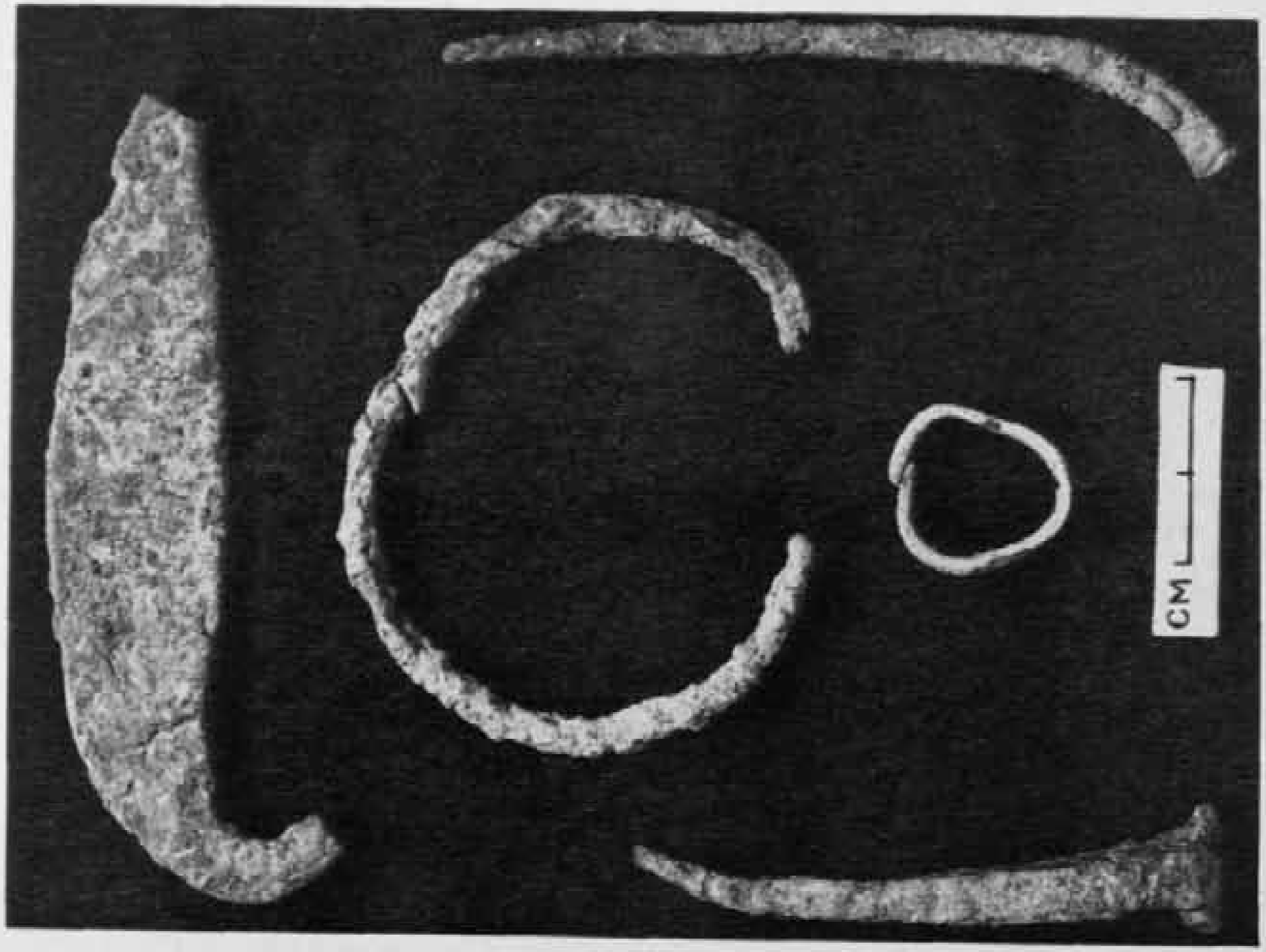


B C

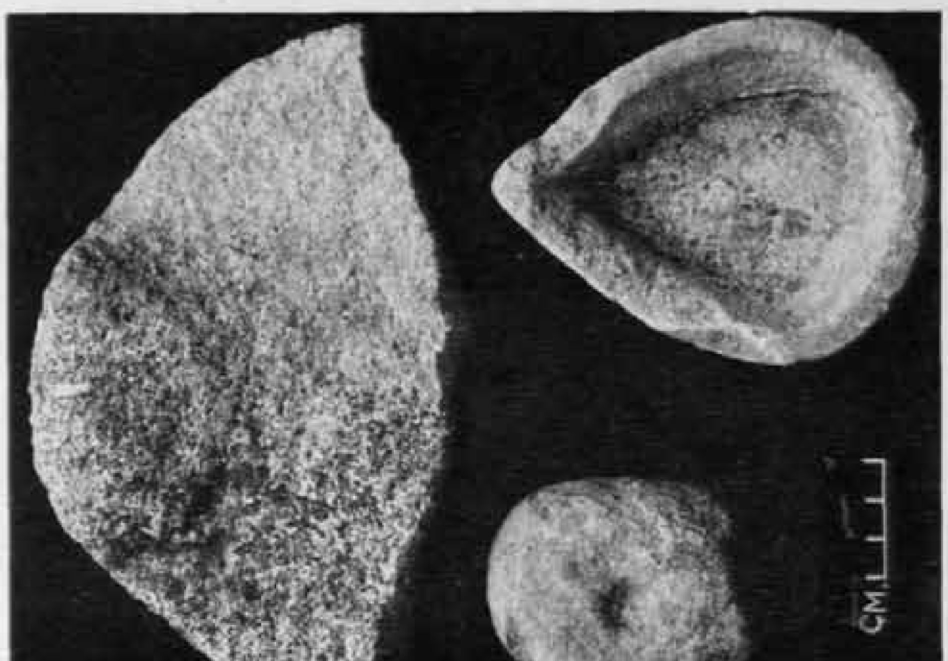
A, *Acheulian artefacts from Balwara* ; B *and* C, *early historical objects from Bijalpur Khurd. See pp. 47-48*



Newal Khera : Middle Palaeolithic tools. See p. 47



C



A



B

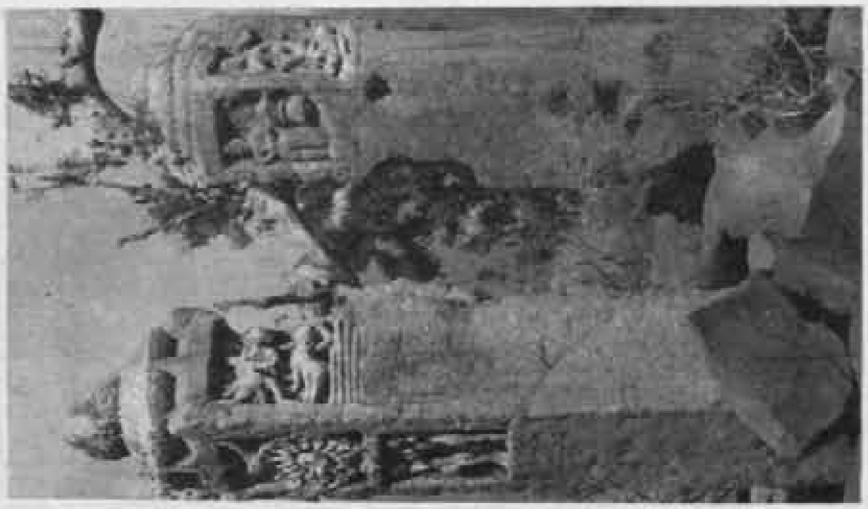
Bijalpur Kalan : A, stone objects ; B, brick with incised design ; C, iron and copper objects. See p. 48



A



B

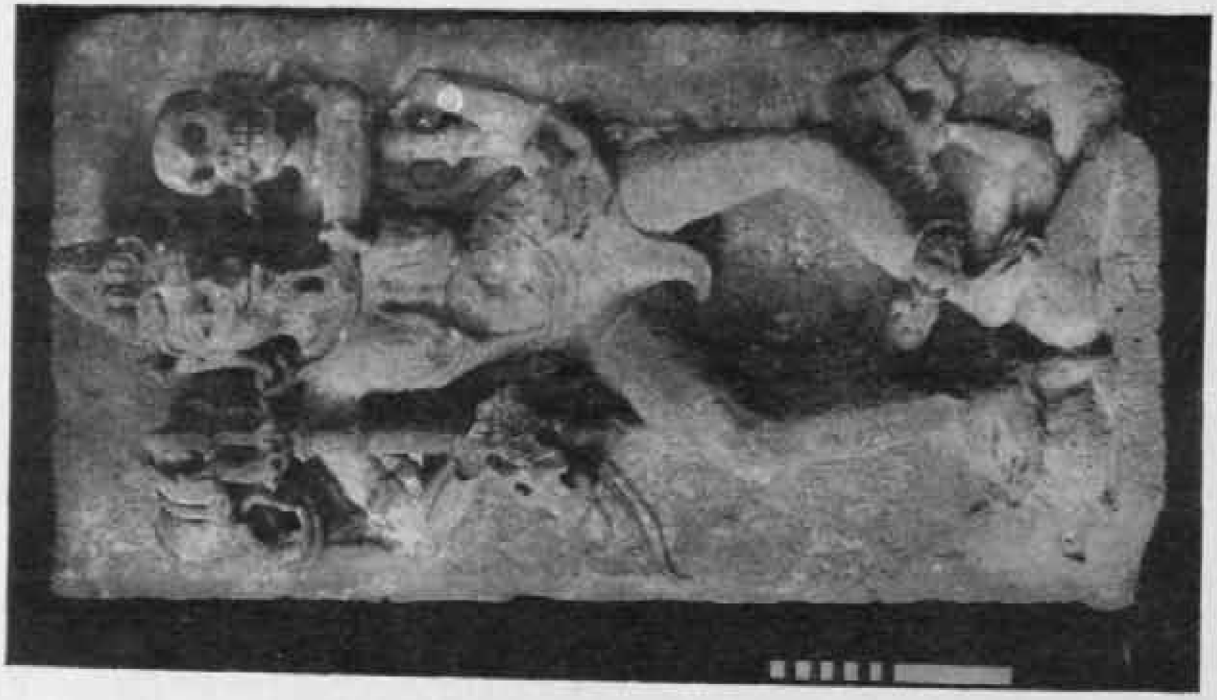


C

A and B. Narasimha and Chamunda from Jogibira ; C. memorial stones from Bijalpur Khurd. *See pp. 48-49*



A



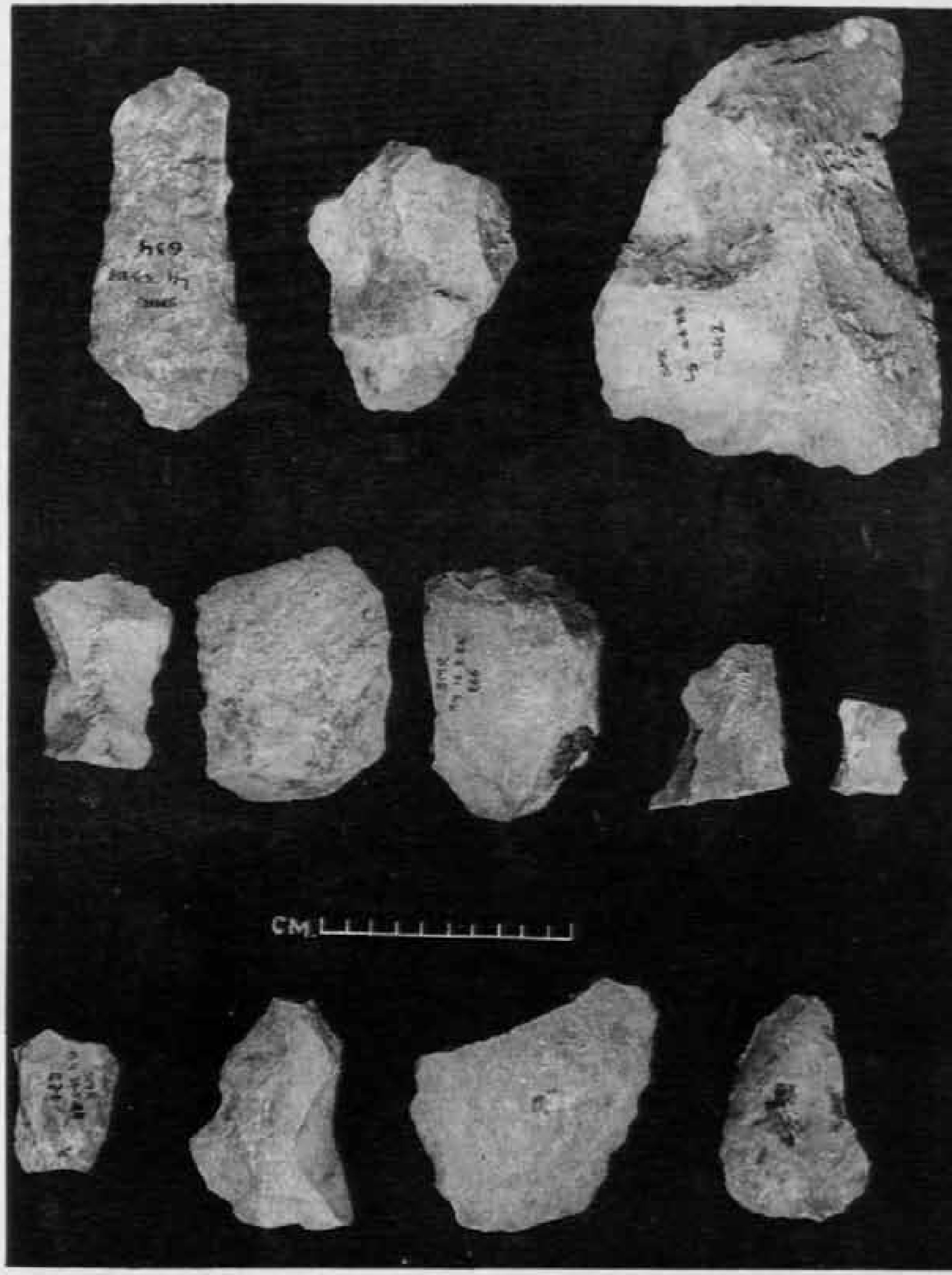
B

Chandel : A, Andhakasuravadhamurti ; B, Chamunda. See p. 65

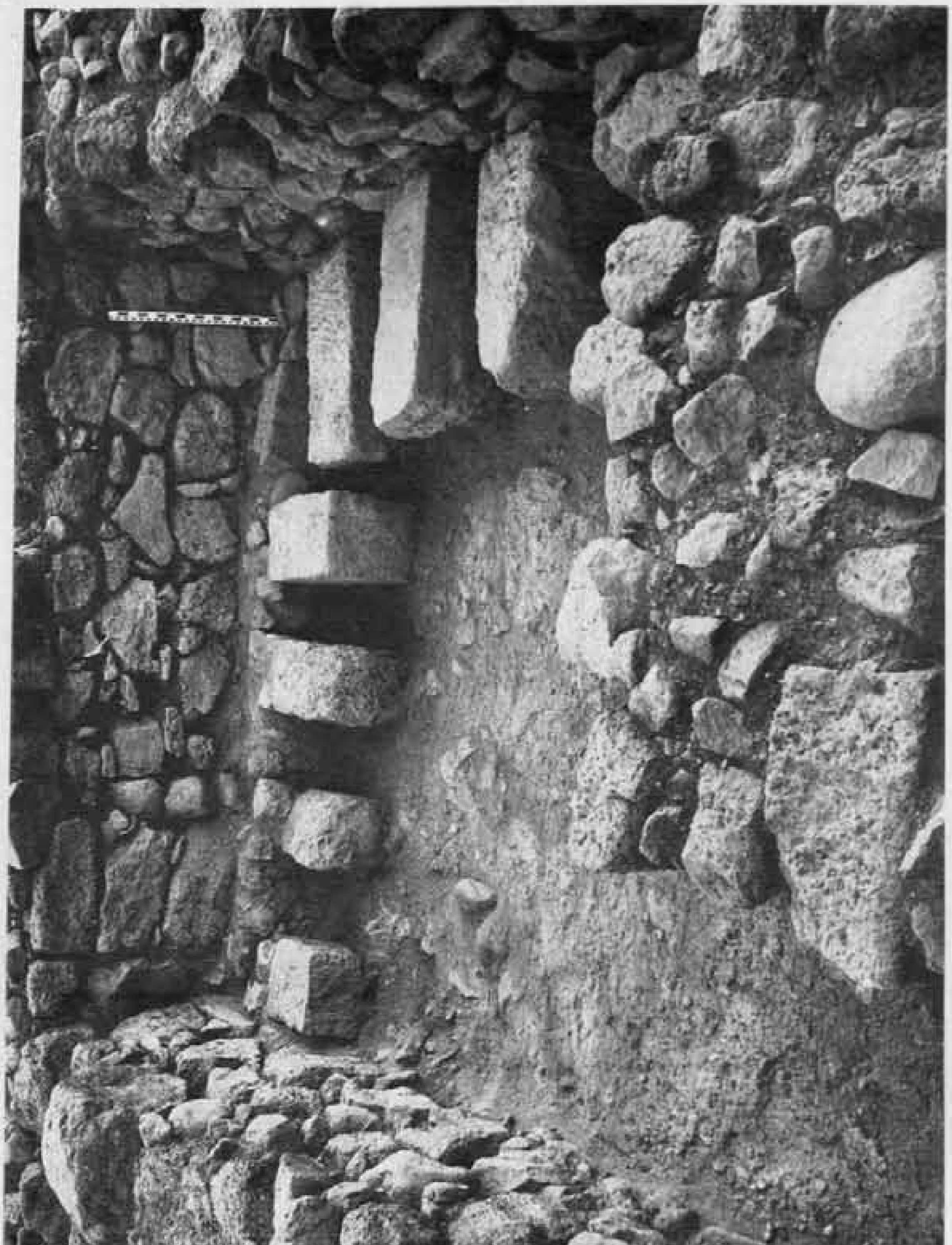


A B C

Saraswati Kund : A, Vishnu : B, Sridhara : C, Surya. *See p. 73*



Samnapur : Middle Palaeolithic tools. *See p. 75*



Daulatabad : exposed toilets. *See p. 83*



A

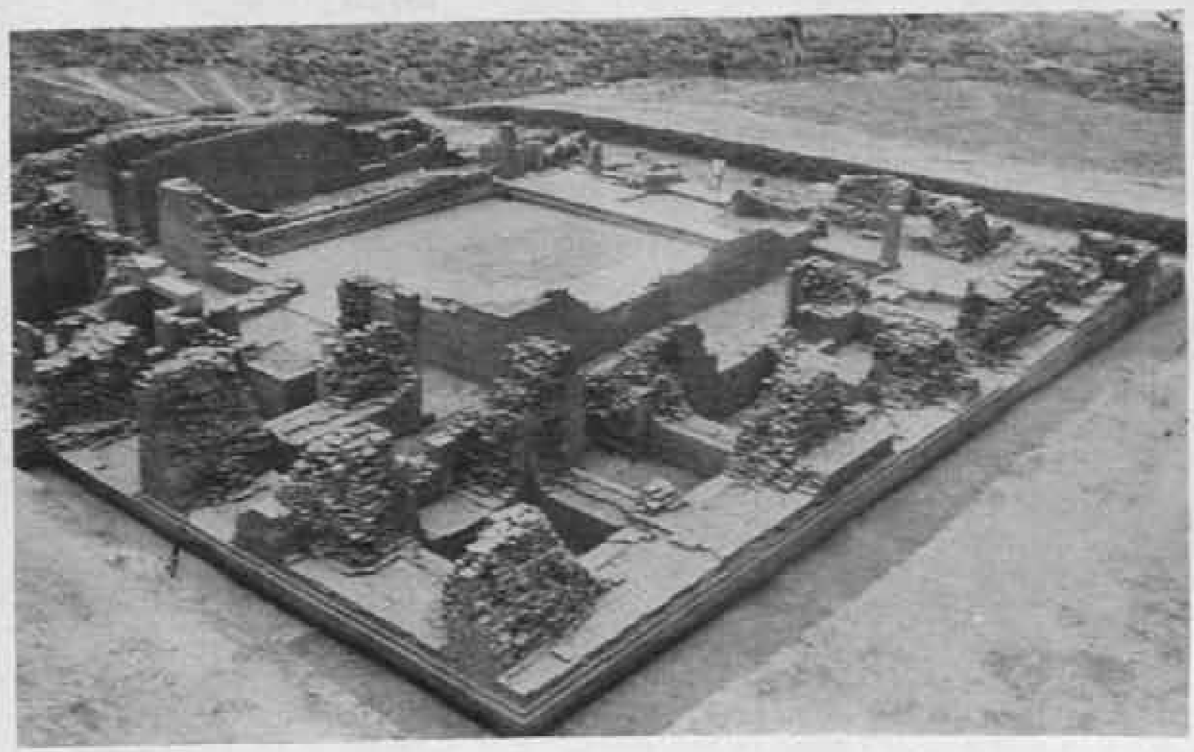


B

Lalitagiri : A, *apsidal chaityagriha and its missing portions* ;
B, *row of votive stupas. See p. 88*

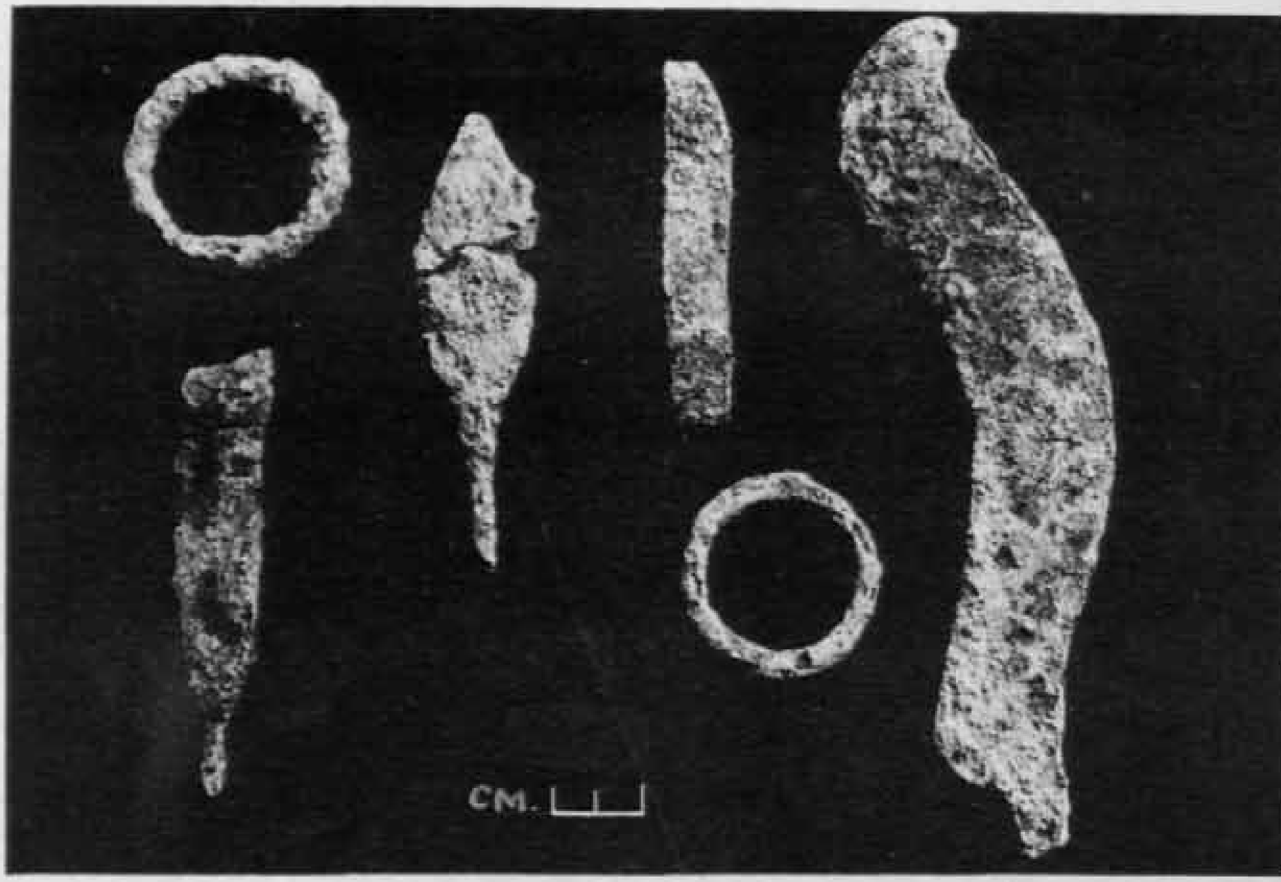


A



B

Udaygiri : A, *general view of the monastery complex* ;
B, *close view of monastery. See p. 90*



A



B



C

Udaygiri : A, *iron objects* ; B, *terracotta plaque* ; C, *votive sealing. See p. 95*



A



B

Sanghol: A, *close view of rectangular and square structures*;
B, *Kushana structures. See pp. 96 and 98*

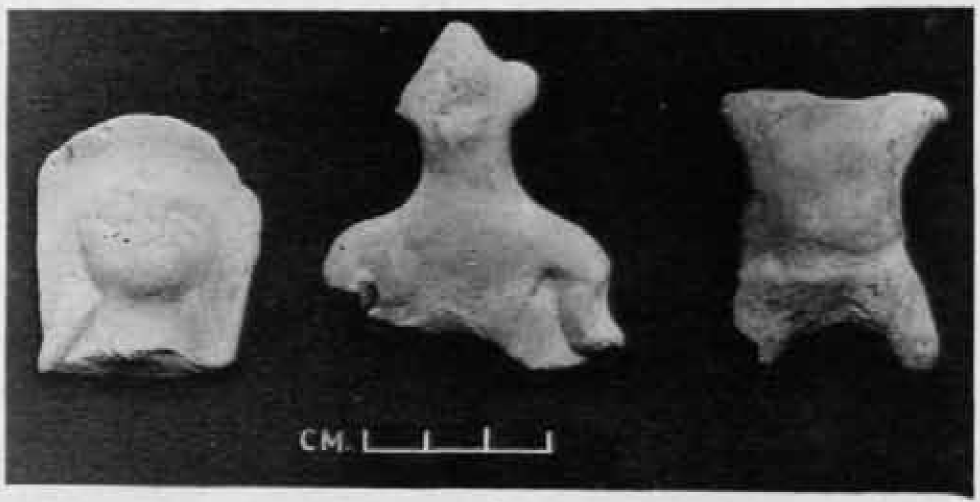


A

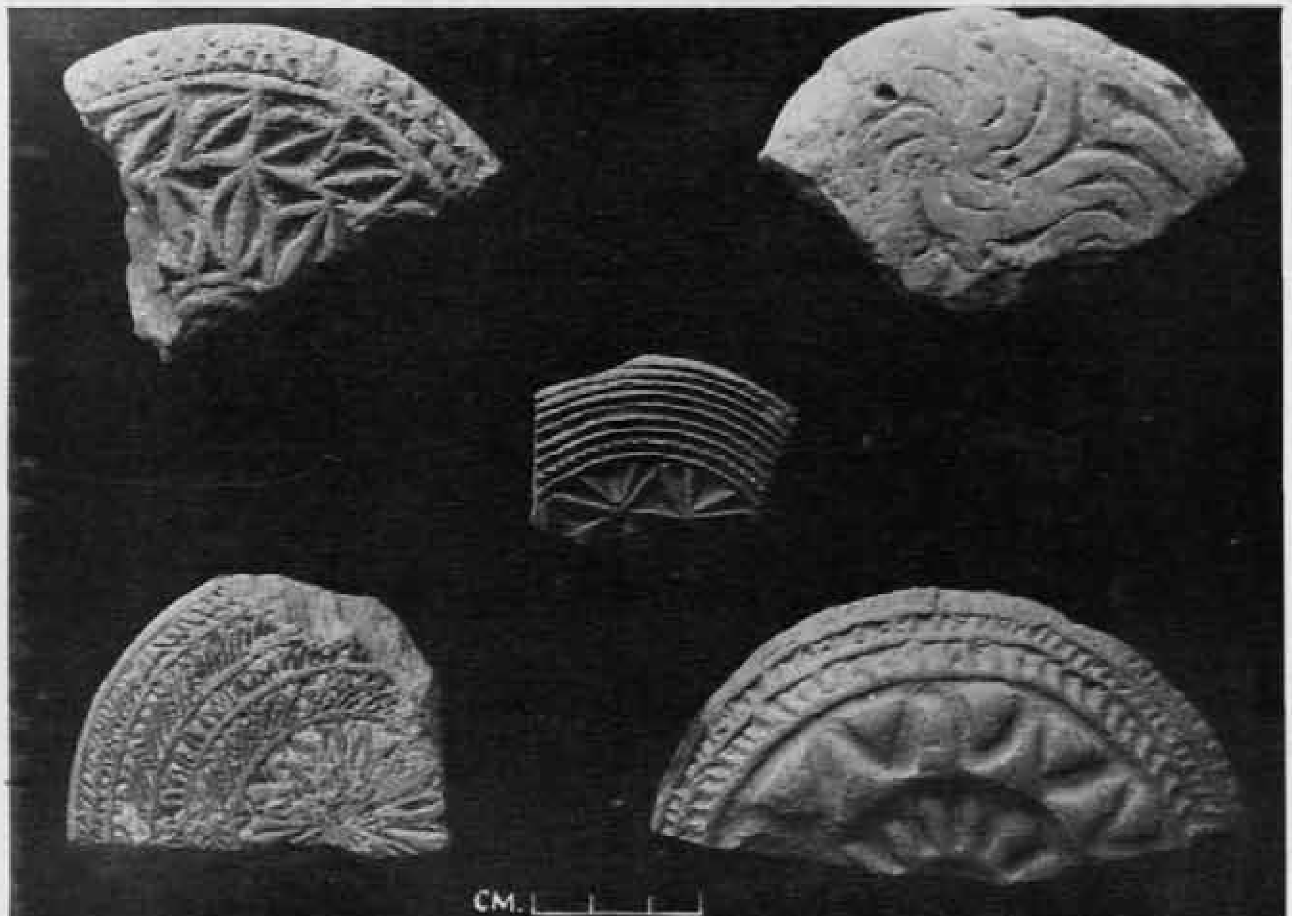


B

Sanghol : A, circular fire hearths ; B, mud floors and walls, cylindrical terracotta object and hearths. See pp. 96-97

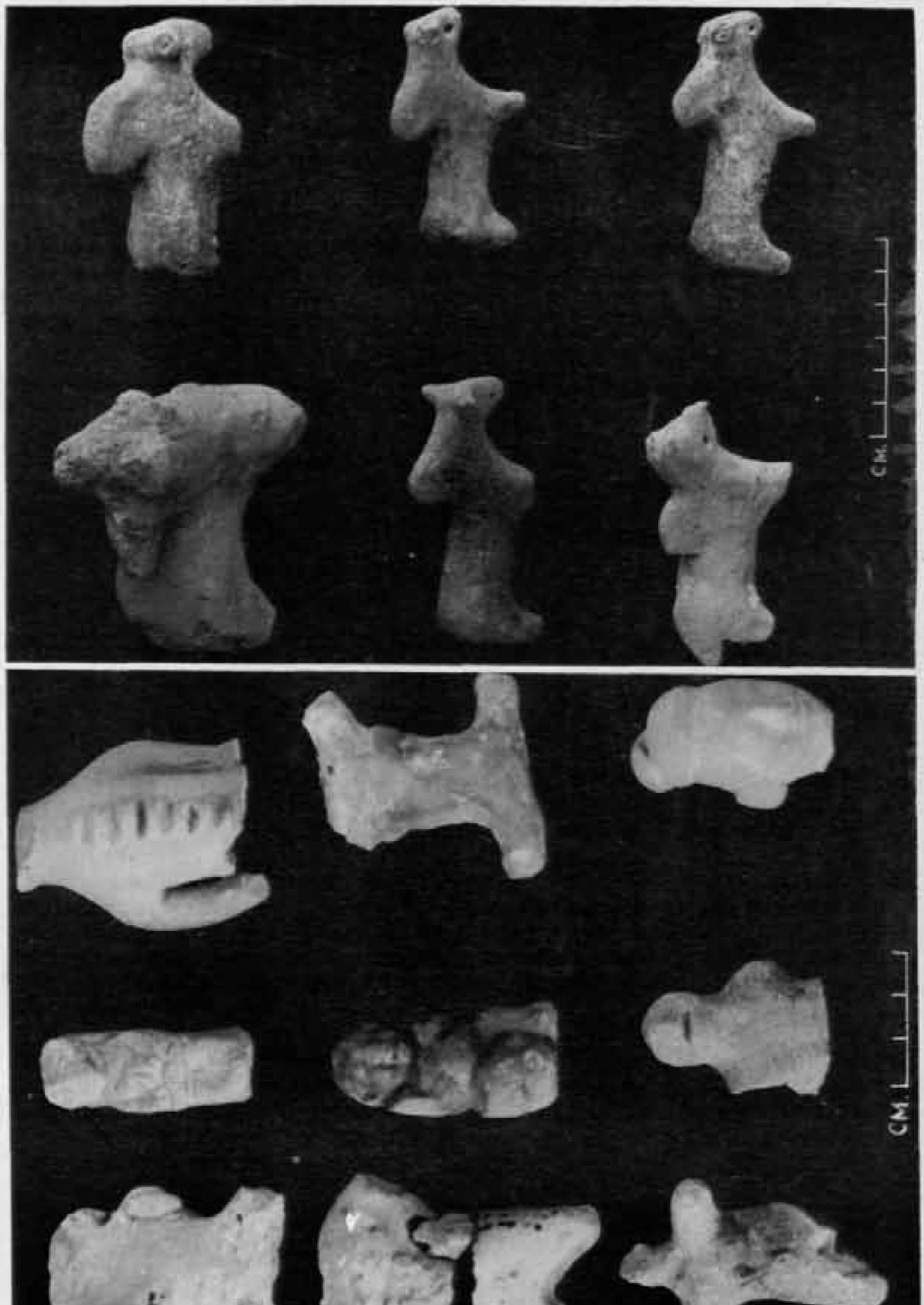


A



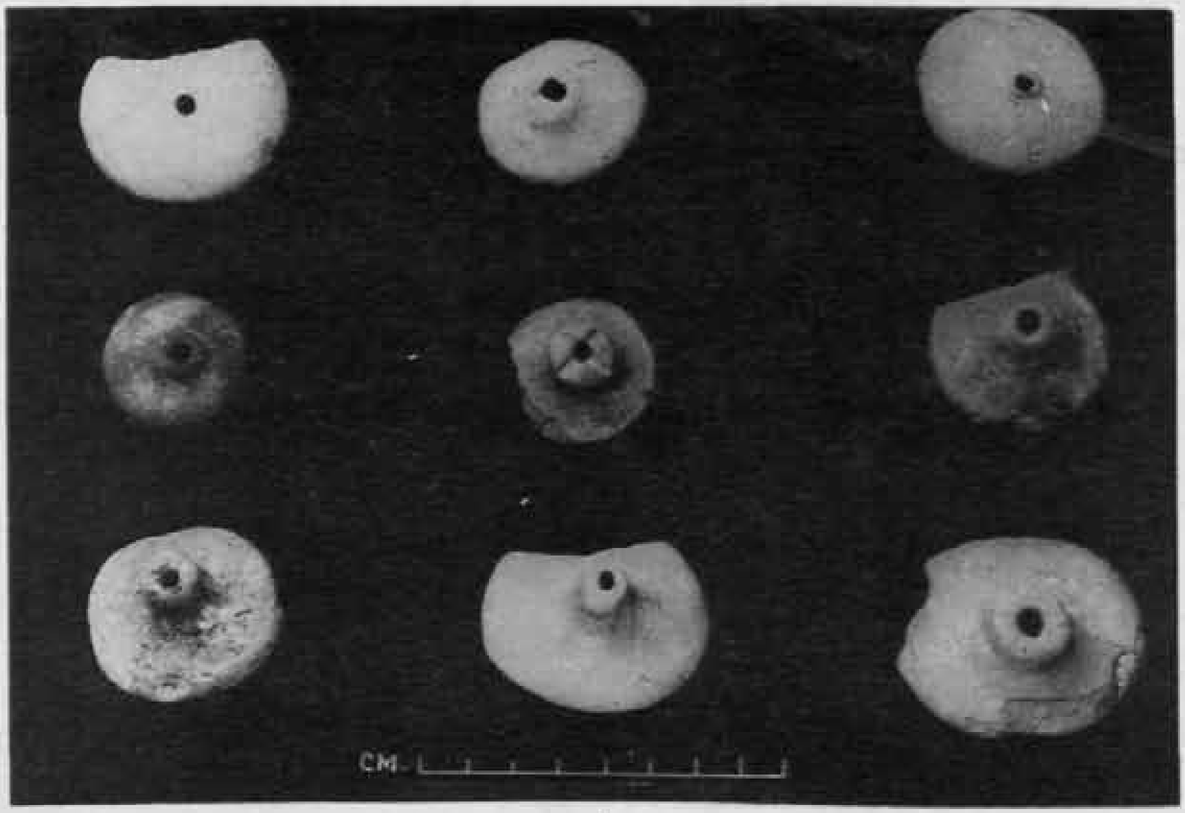
B

Sanghol : terracotta, A, *human figures and* B, *circular stamps. See p. 99*

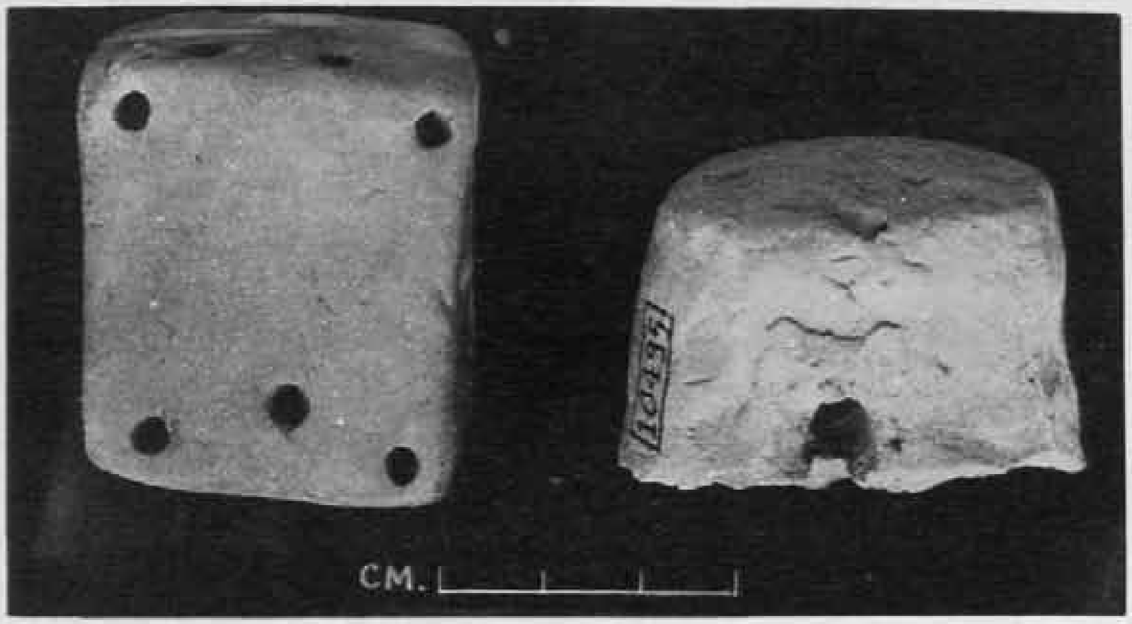


A

Sanghol : terracotta, A, human figurines, and B, animal figurines. See p. 98

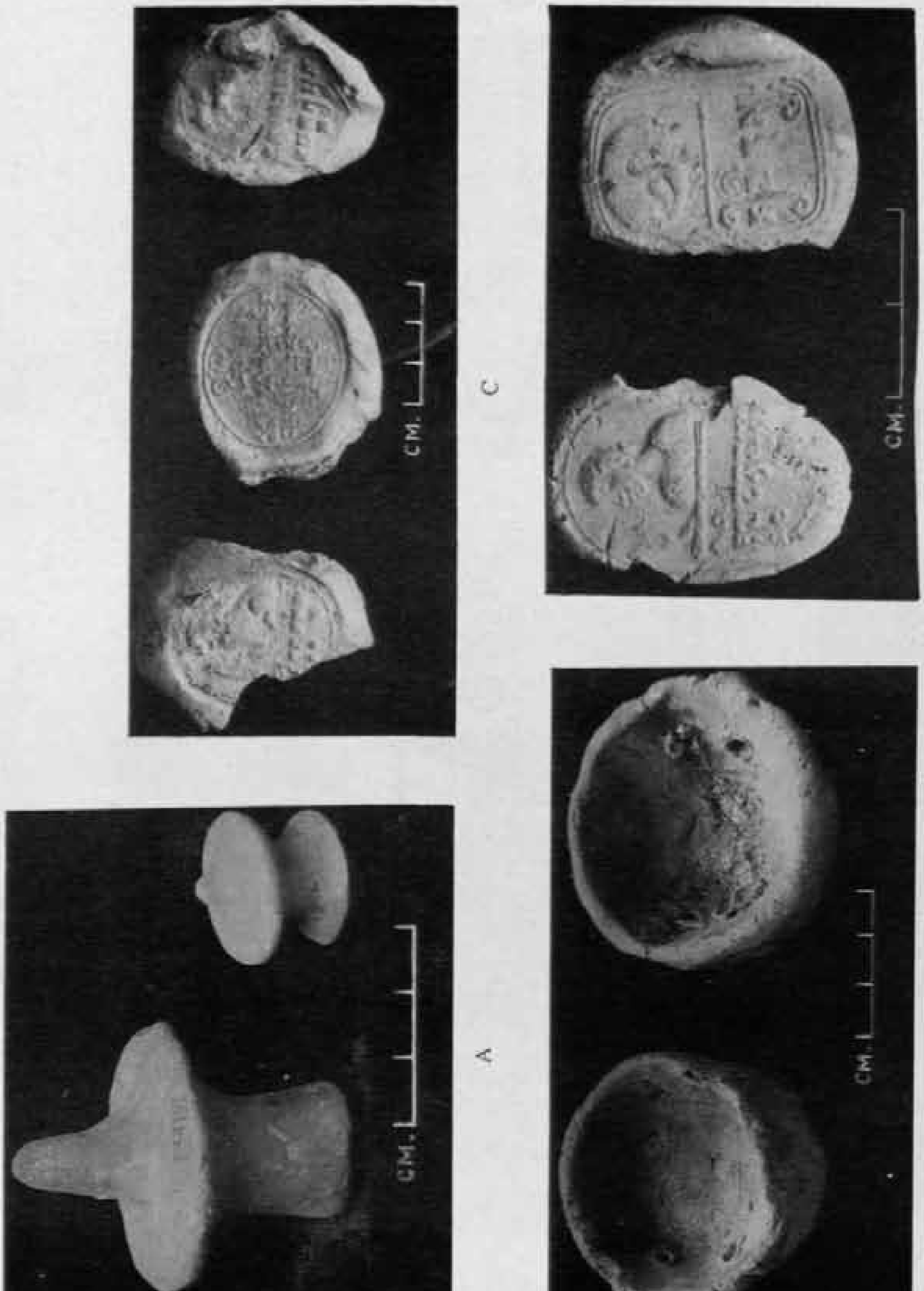


A

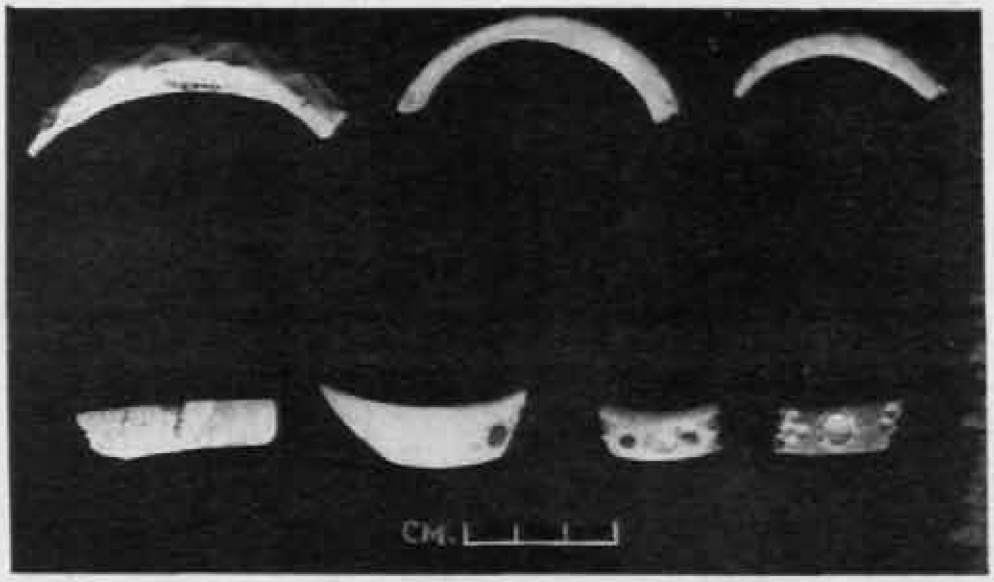


B

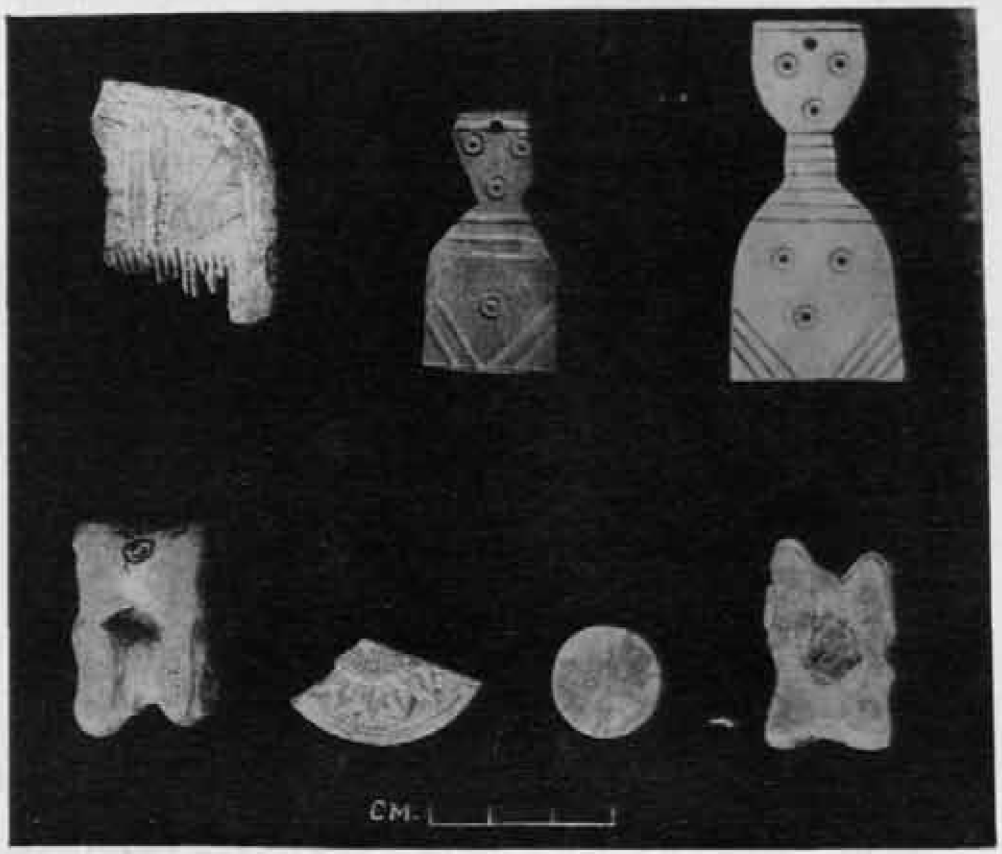
Sanghol : terracotta, A, *toycart wheel, and* B, *toycart frame.* *See p. 99*



Sanghol : terracotta, A, ear-studs, and B, weighing pans ; C and D, inscribed seals and sealings. See p. 99

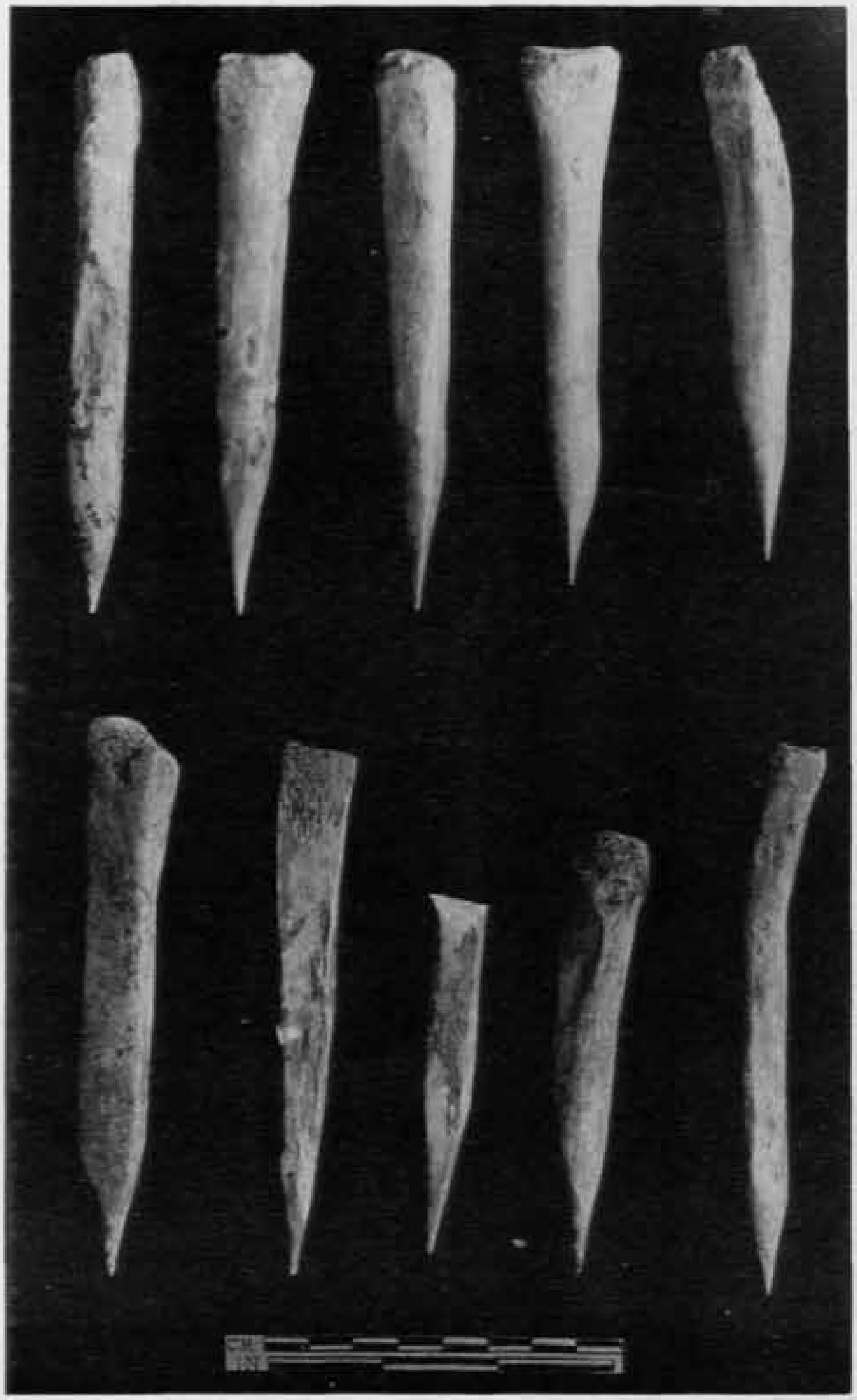


A

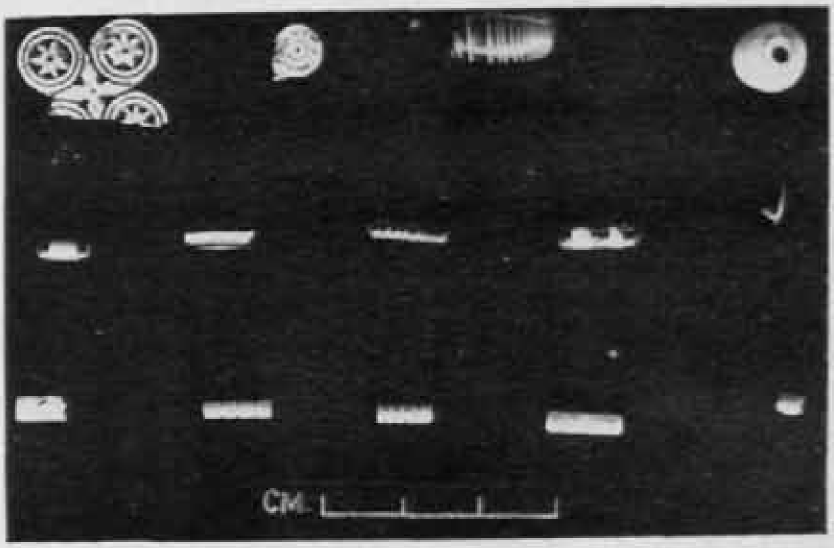


B

Sanghol : A, *shell bangles* ; B, *ivory objects. See p. 99*



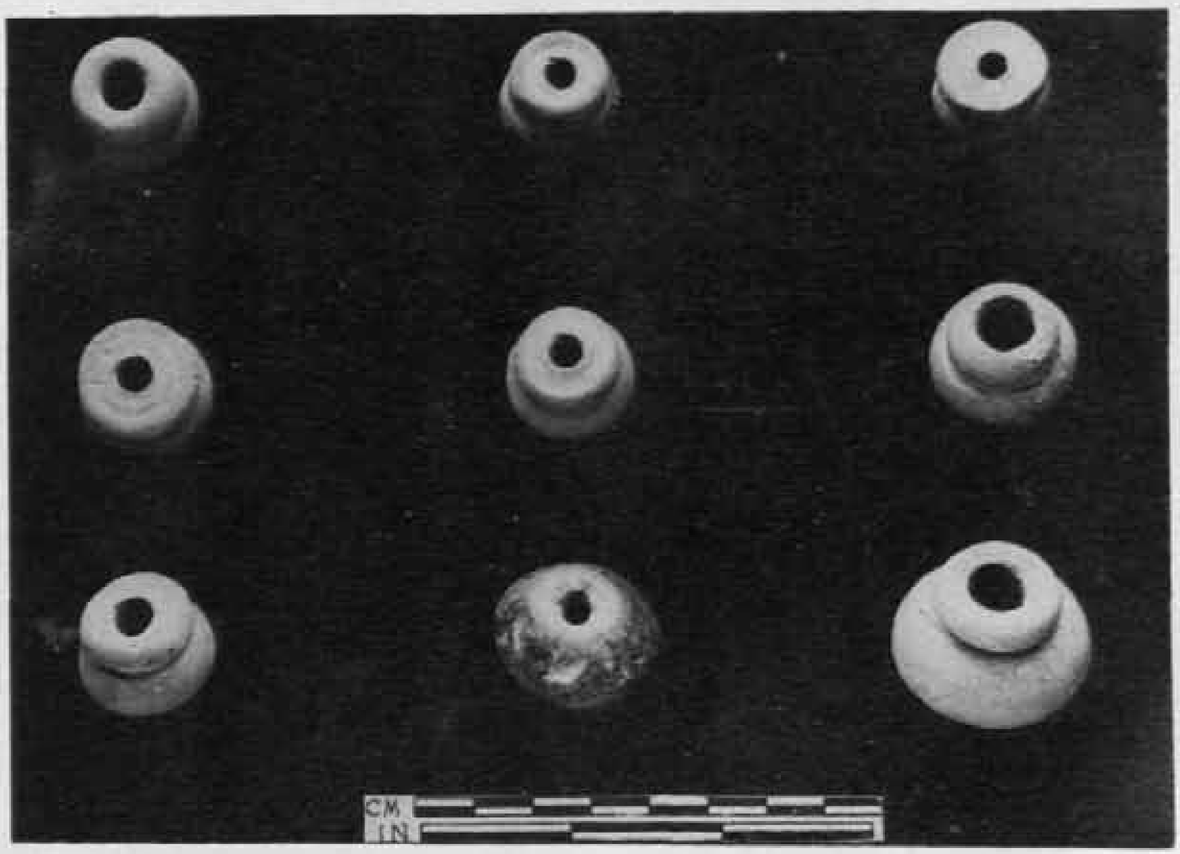
Sanghol : bone points. See p. 99



A

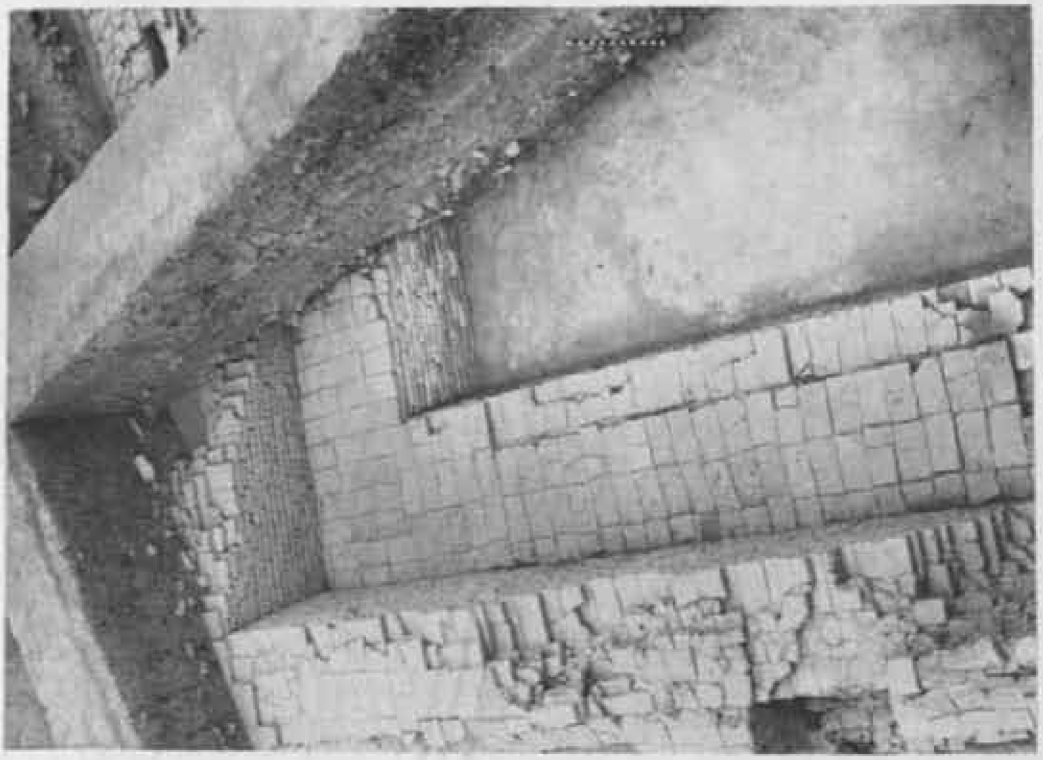


C

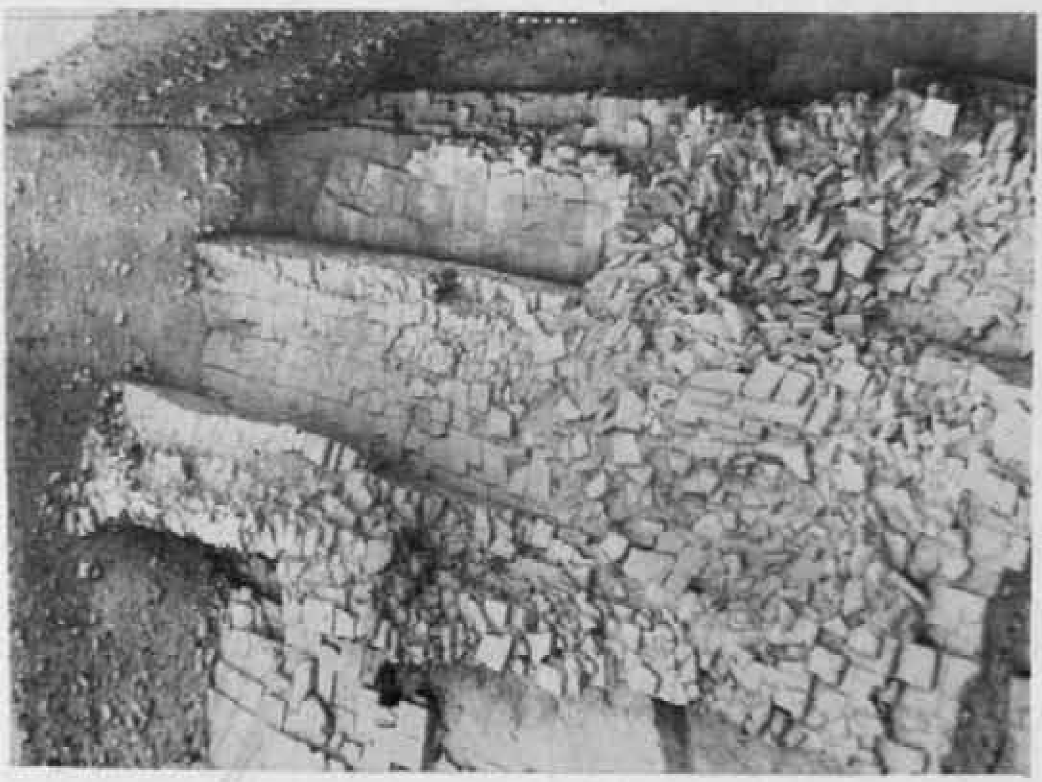


B

Sanghol : beads of, A, *semiprecious stones, paste and faience, and* B, *terracotta ;*
C, *sankha with bell shaped cover at top.* *See p. 99*



B



A

Sravasti : different terraces of tank. *See p. 107*



A



B

Sravasti : A, *flight of steps leading to tank* ; B, *circular stupa.* *See p. 107*



A



B



C

Sravasti : *terracotta*, A, *human figure*, B, *Buddha head, and* C, *sealing*. *See p. 108*



A



B

Mangalkot : A, *black-slipped ware* ; B, *terracotta plaques. See p. 113*

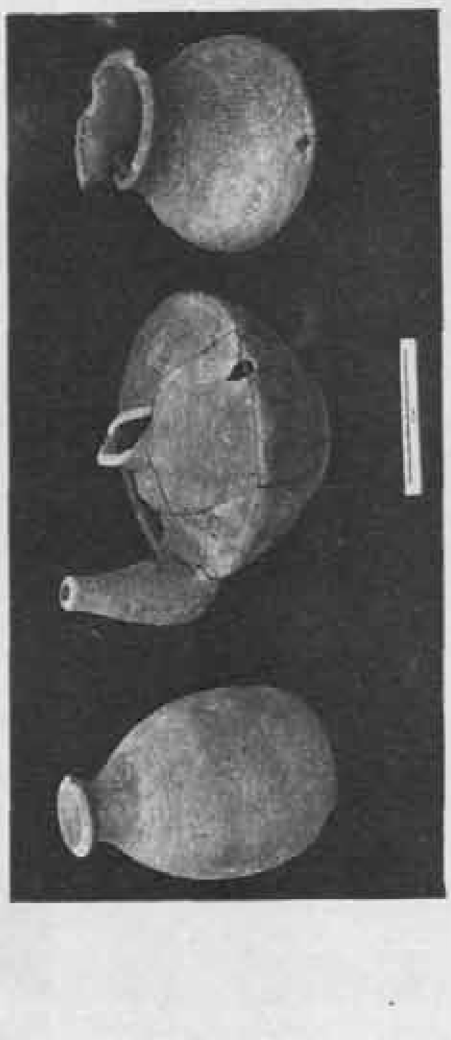


A



B

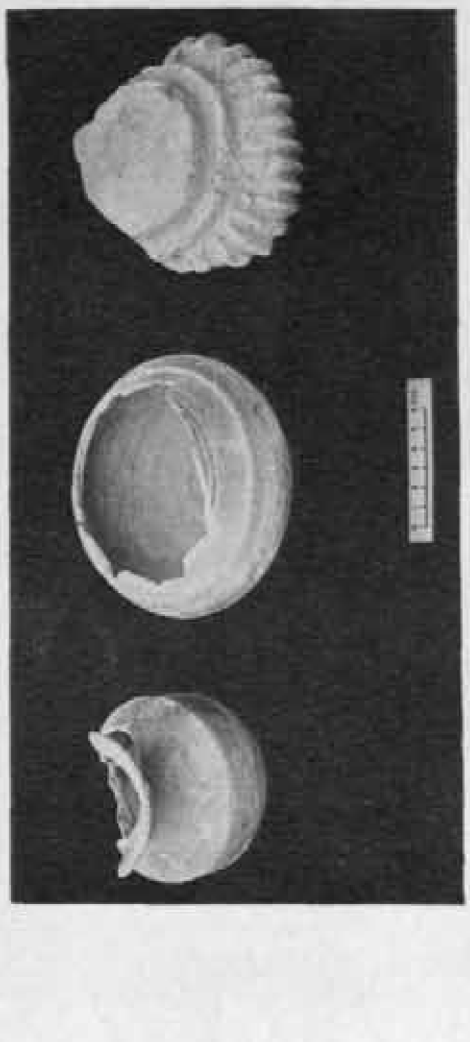
Mangalkot : A, *well, Period IV* ; B, *structure, Period V. See pp. 113-114*



A



B

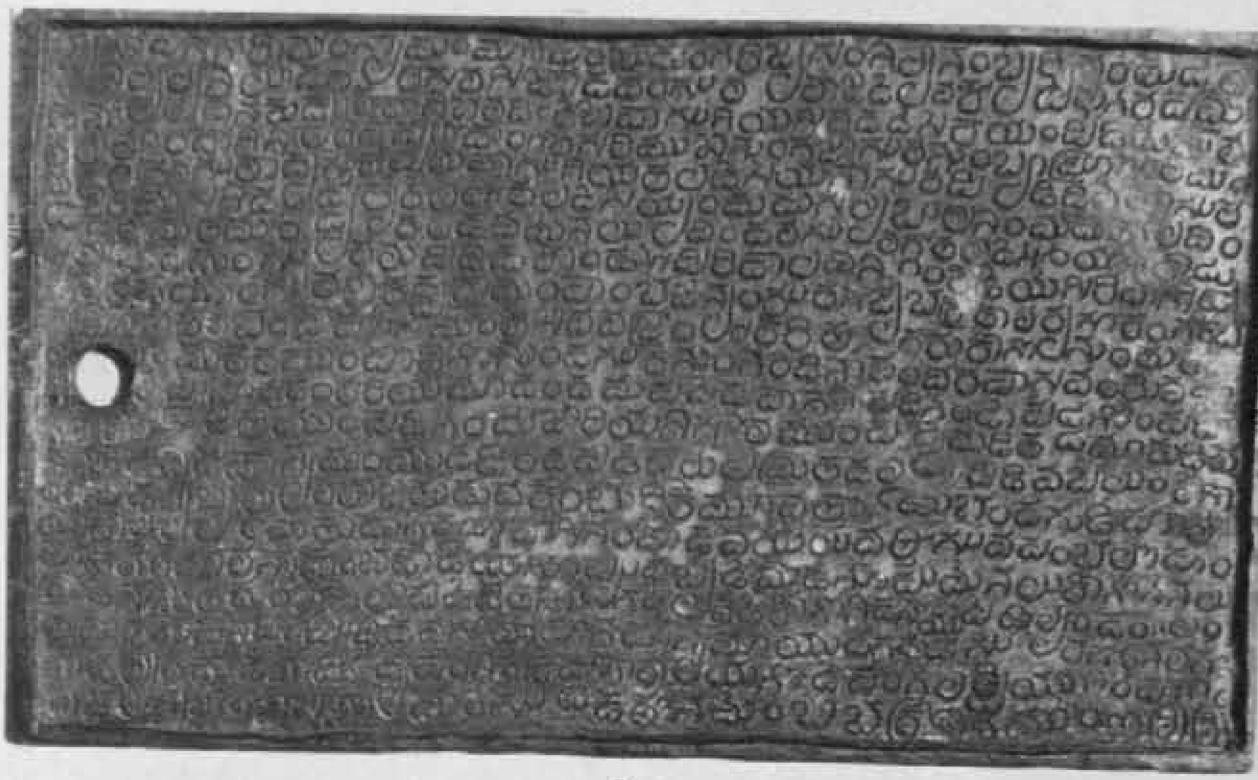


C

Mangalkot : A, pottery and B, terracotta figurines, Period IV ; C, miscellaneous objects, Period V. See p. 113



A



B

Anegundi : copper-plates, twelfth-thirteenth century. *See p. 118*



A



B

A, *Bhingoli : Kalachuri inscription* ; B, *Sevur : Kongu-Chola inscription. See pp. 120 and 122*



A



B

A, *Khambat : inscription of Firuz Shah Tughluq* ; B, *Shujapur : inscription of Husain Shah of Bengal. See pp. 124 and 130*



B



A

Patan : A, inscribed image of Rani Udayamati from Rani-ki-Vav ; B, fragmentary inscription from Vav. *See p. 135*



A B C

Badamibagh, Srinagar : image of. A. Buddha : B. Siva : C. Lokesvara-Siva. *See p. 137*



B



A

A. *Talagaon : Rudra Pasupati* ; B. *Hirapur : Chamunda.* *See pp. 137-138*



B



A

Government Museum, Mathura : A. life-size yaksha image from Bharna Kalan Goverdhan ;
B. Surya from Madaur. *See p. 156*



Hazarduari Palace Museum, Murshidabad : marble seat and silver chair in Durbar hall. *See p. 157*



A

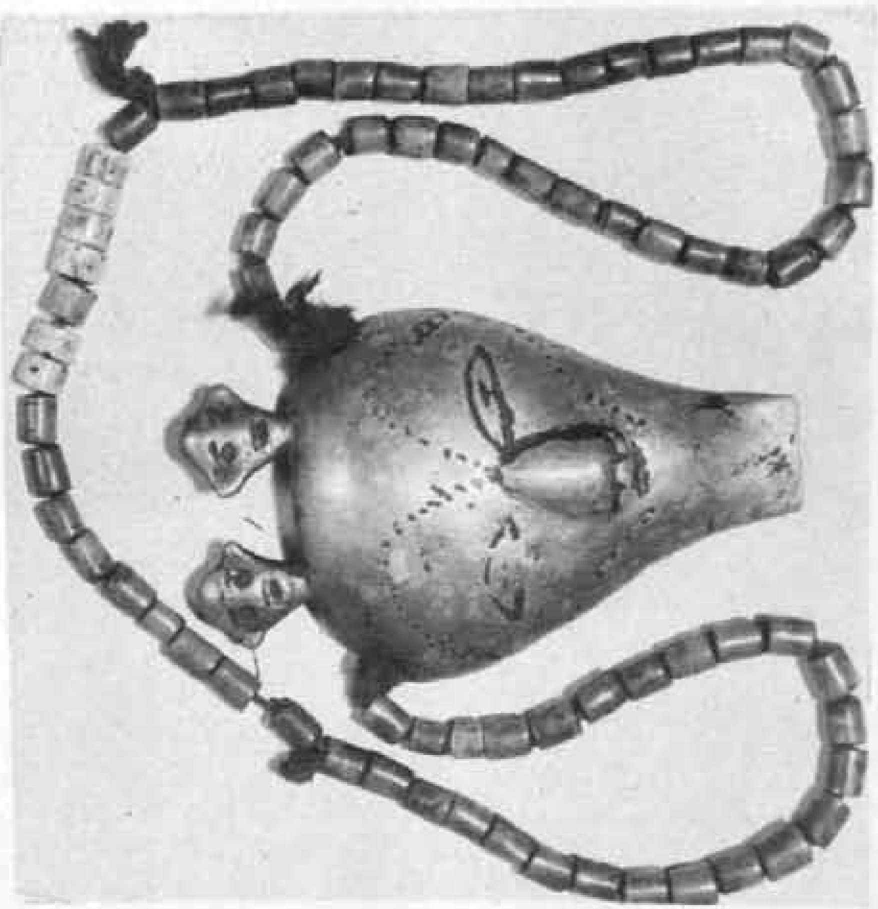


B

Hazarduari Palace Museum, Murshidabad : A, *landscape gallery* ;
B, *British portrait gallery. See p. 157*



A



B

National Museum, New Delhi : A, mother and child, wood, Bastar ; B, pendant of a head-hunter, Nagaland. See p. 157



A



B

A, *Hirai Mata temple, Hirapur* ; B, *Siva temple, Borut. See p. 159*



B

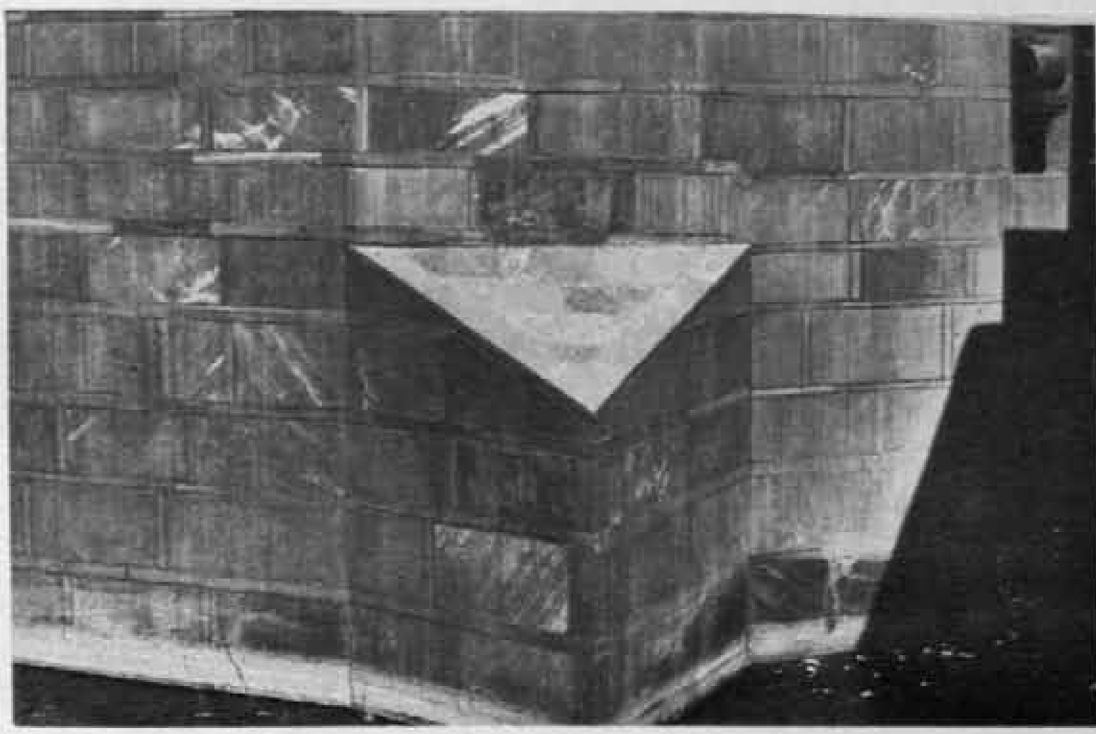


A

A. standing female figure in a half close door from Nadner ; B. Narasimha figure, Dharmapuri. *See pp. 161 and 163*

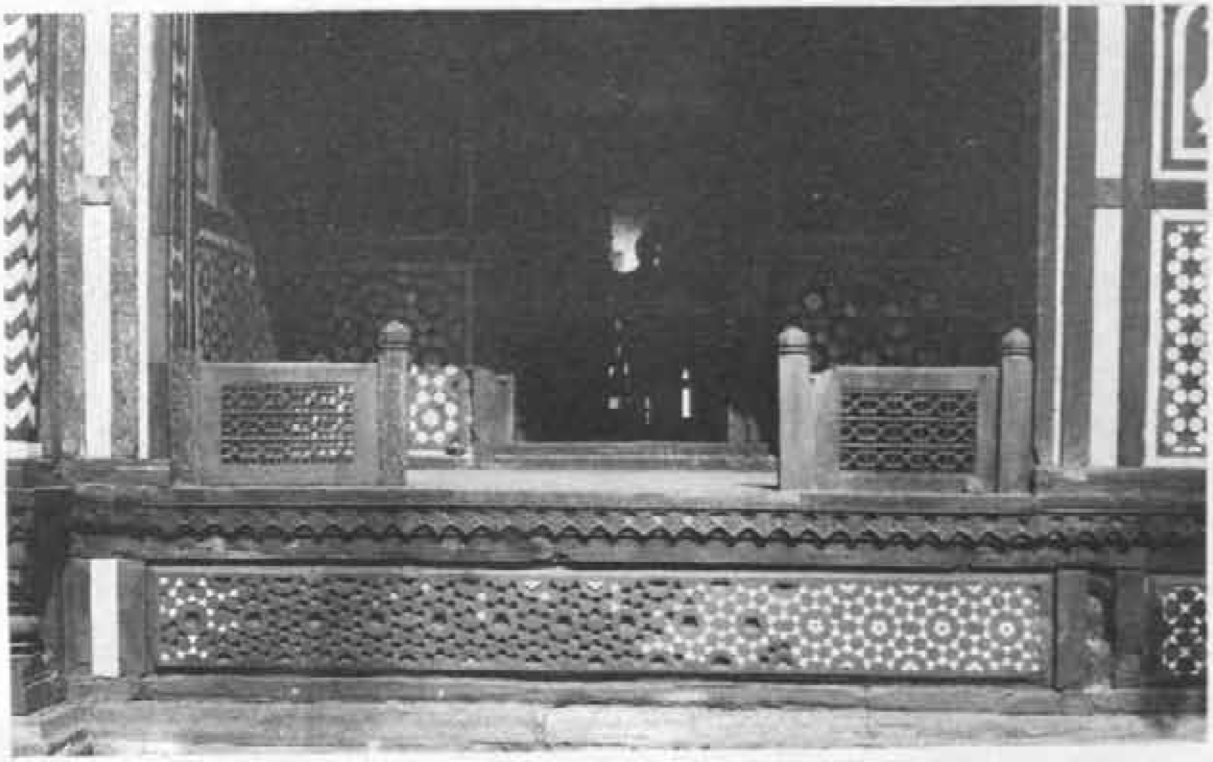


A

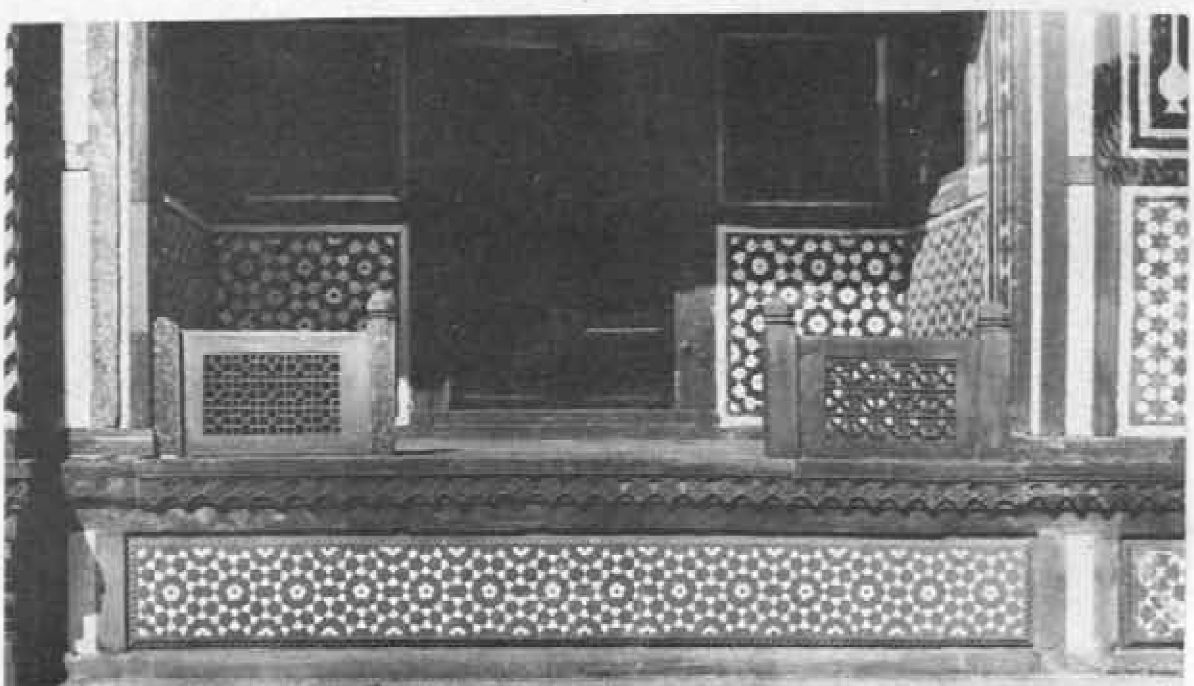


B

Agra: Agra fort, fortification wall, A, before and B, after repairs. *See p. 171*

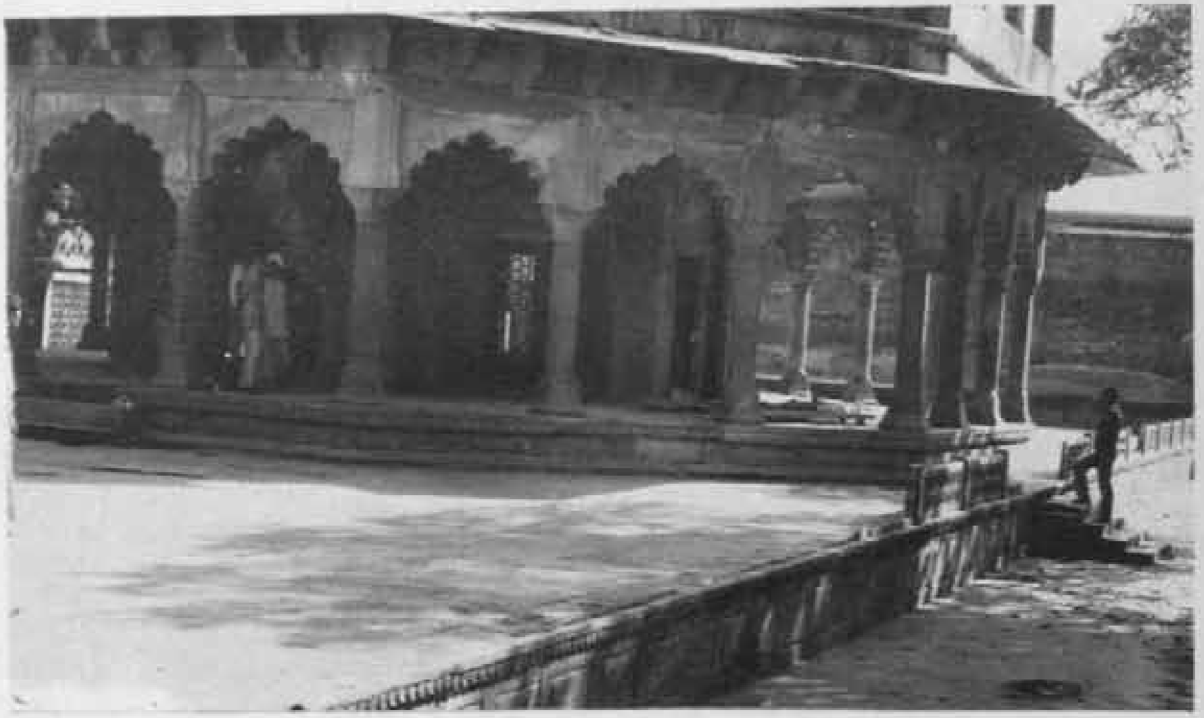


A

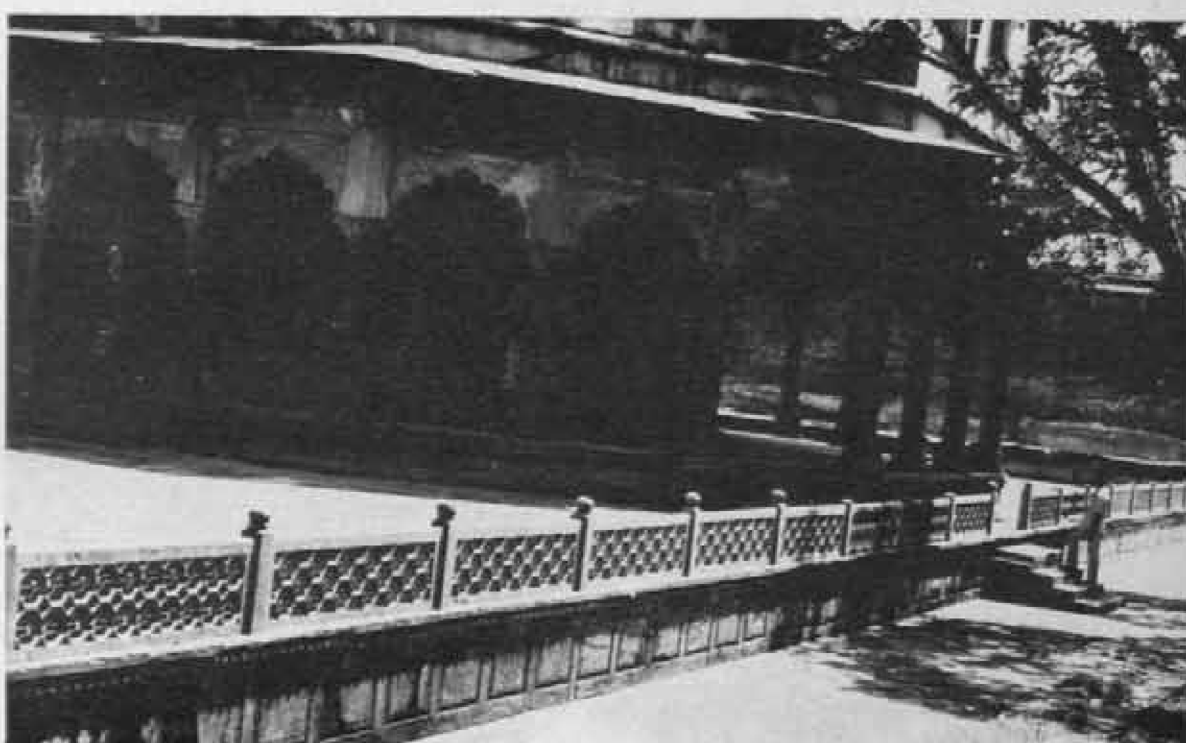


B

Agra : Itimad-ud' Daula's tomb, inlay work, A. before and B. after repairs. See p. 171



A

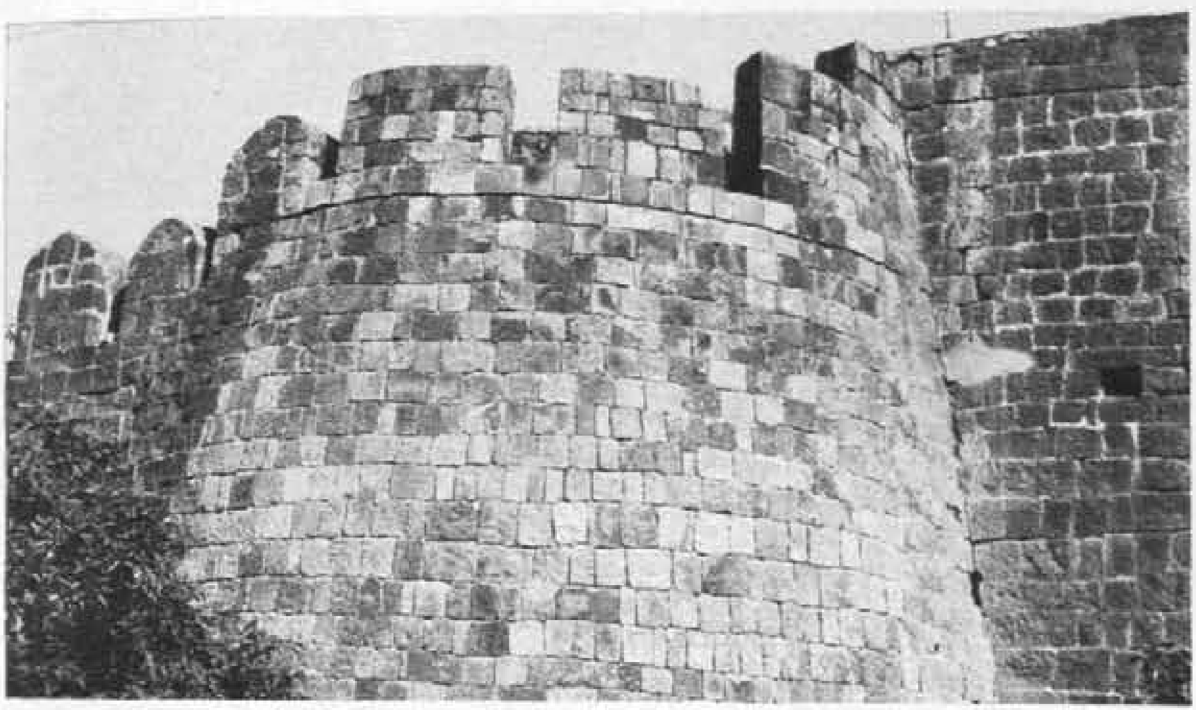


B

Agra : Taj Mahal, Saheli Burj, A, *before and* B, *after conservation. See p. 172*



A



B

Daulatabad : fort bastion, A, *before and* B, *after reconstruction.* *See p. 173*

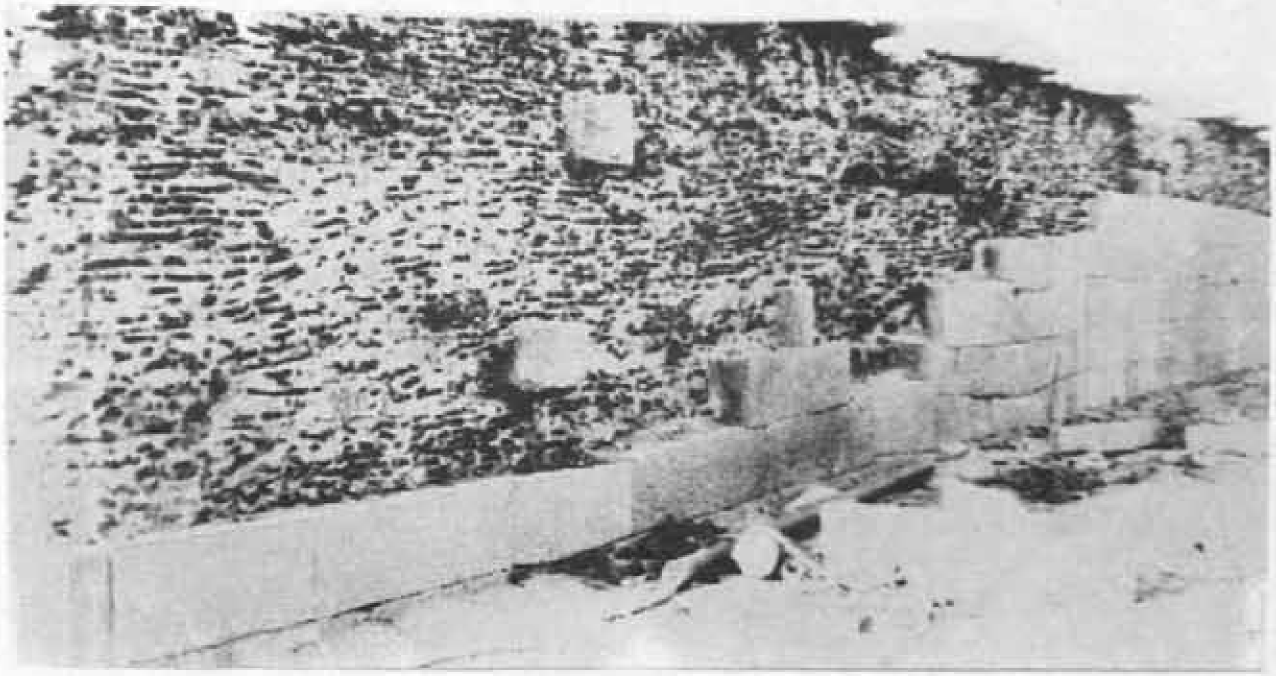


A

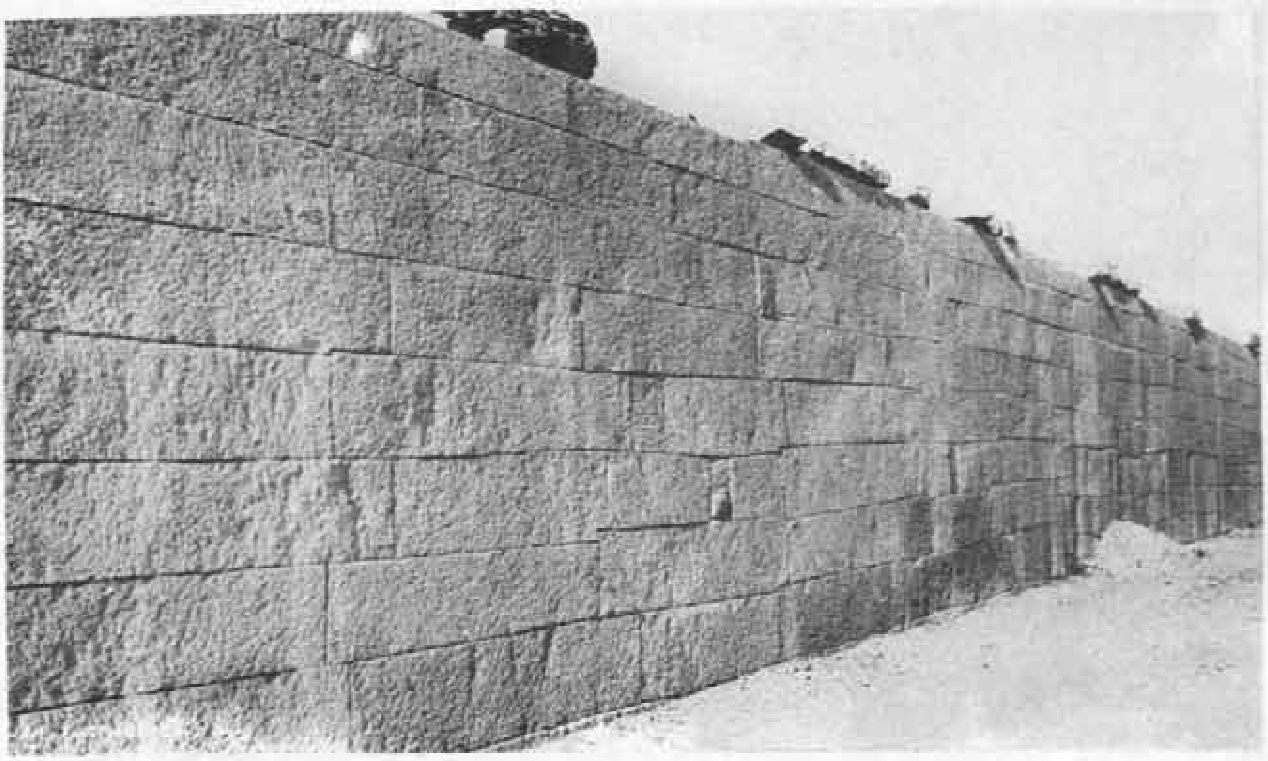


B

Kamalapuram : Hazara кama temple. A, before and B, after conservation. See p. 175



A



B

Kamalapuram : *Pattabhirama temple, prakara wall*, A, *before and* B, *after conservation*. *See p. 176*



A



B

Krishnapuram: Krishna temple, mahadvara, A, *before and* B, *after repairs. See p. 176*



A



B

Venkatapuram : Vitthala temple, navaranga, A, *before and* B, *after conservation, See p. 176*

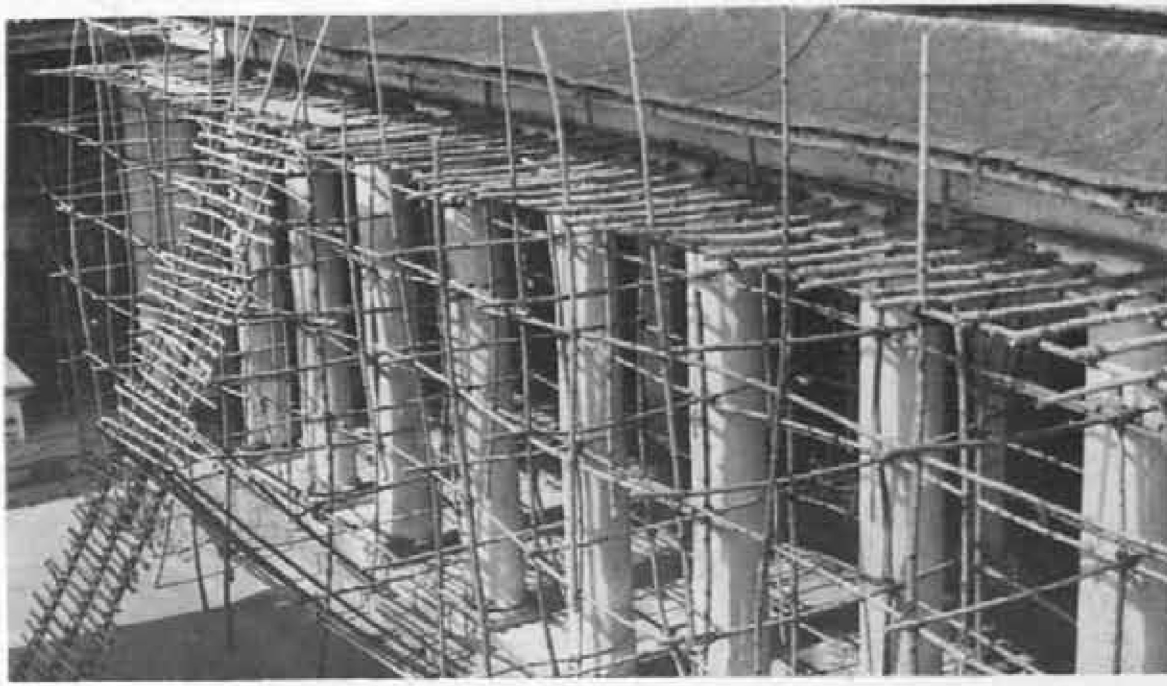


A



B

Cholachaguda : mandapa of Banashankari temple, A, *before and* B, *after conservation.* *See p. 177*



A

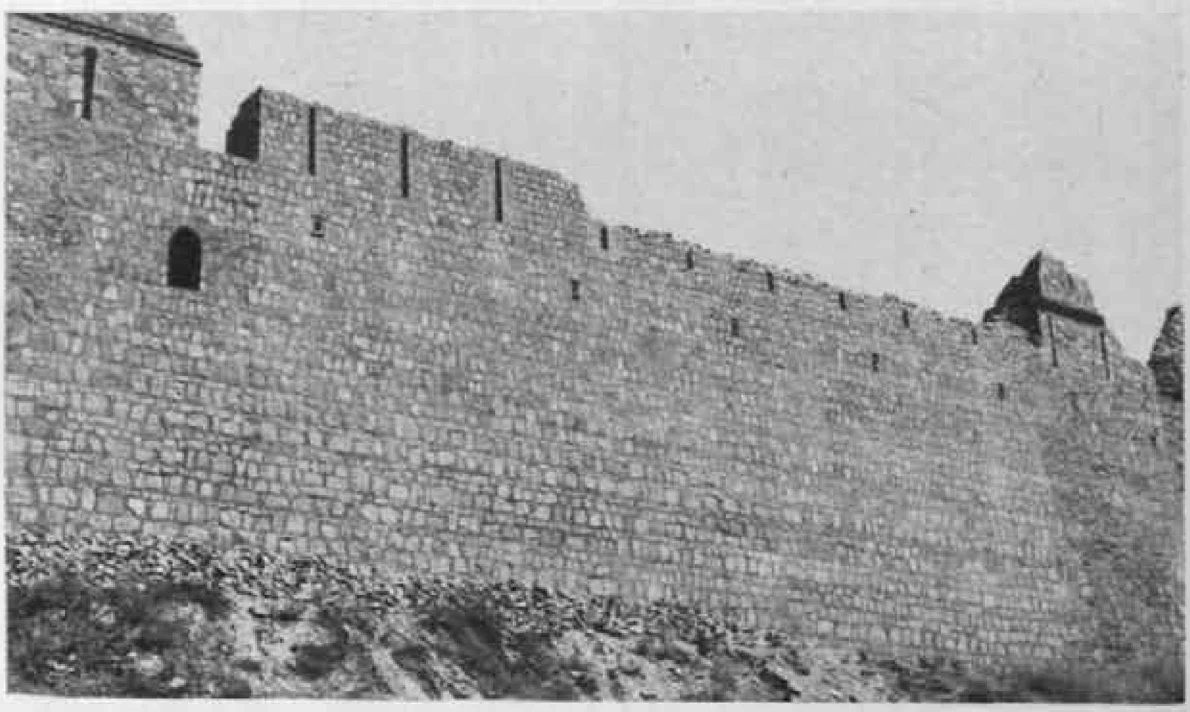


B

Murshidâbad : *Imambara*, A, *during and* B, *after conservation*, *See p. 186*

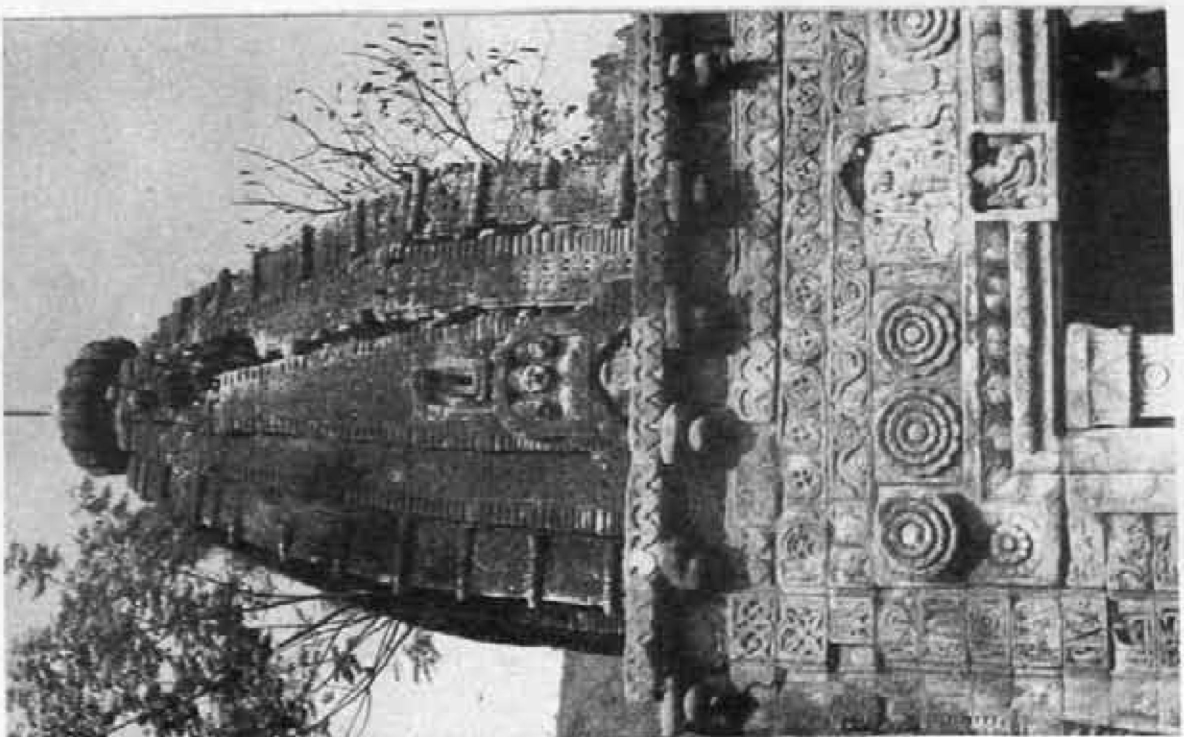


A

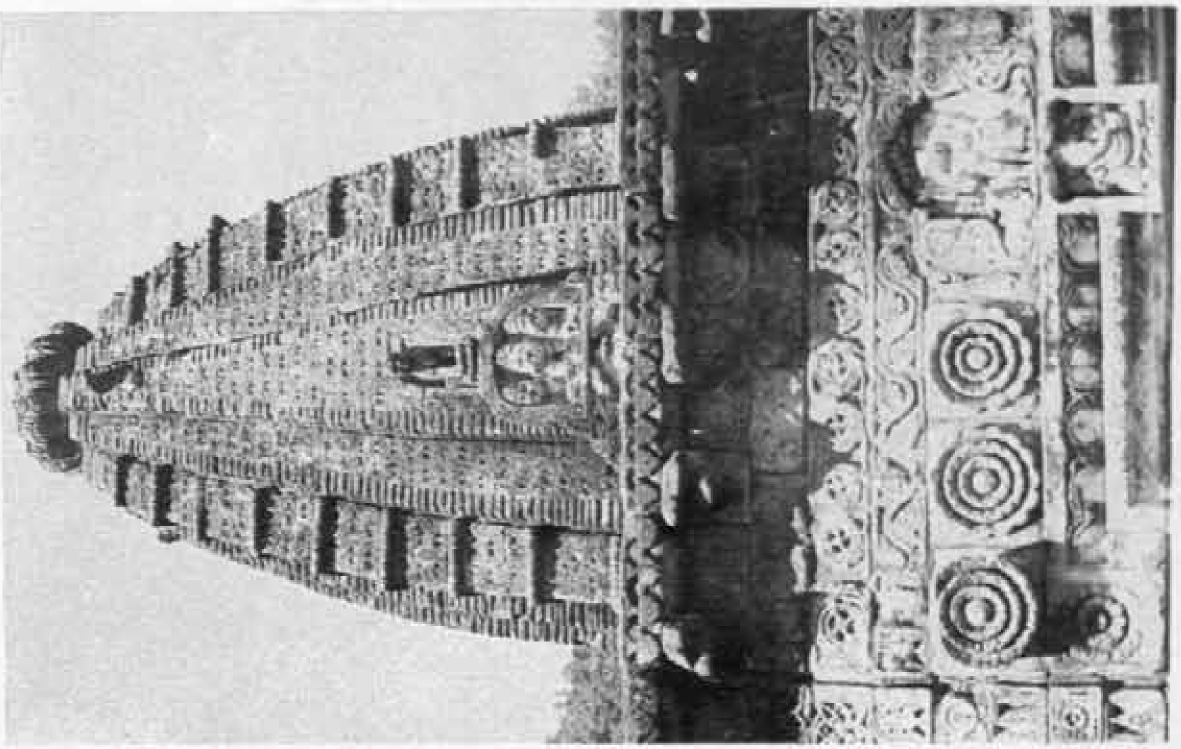


B

New Delhi : Purana Qila, fortification wall, A, *before and* B, *after reconstruction. See p. 188*



A



B

Mandi : Ardhanarisvara temple, A, before and B, after conservation. *See p. 202*

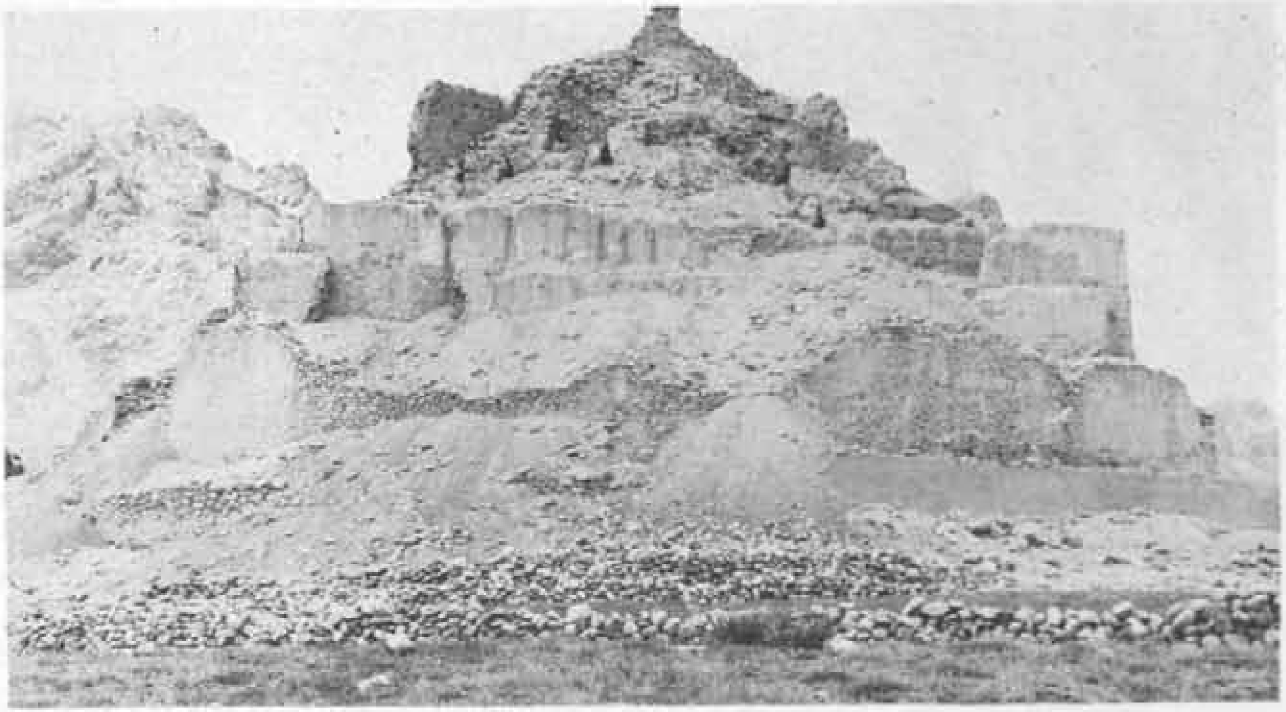


A

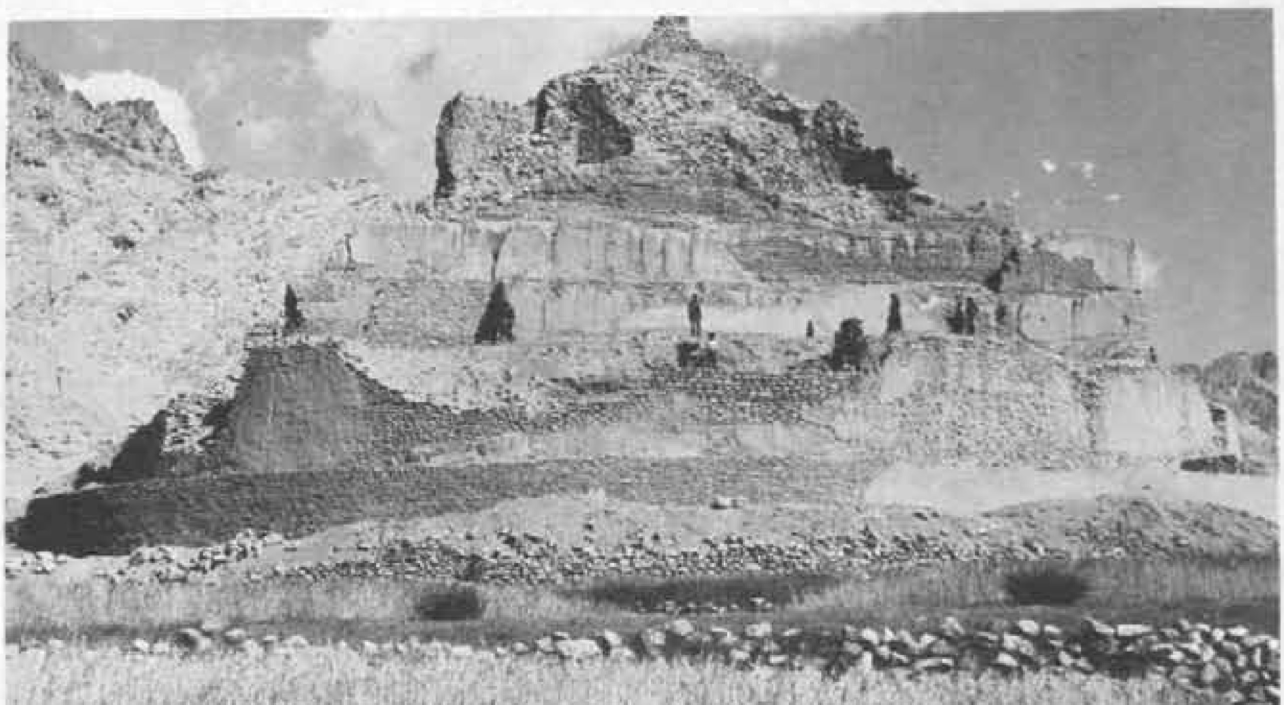


B

Parihaspura : *Stupa*, A, *before and* B, *during conservation. See p. 203*

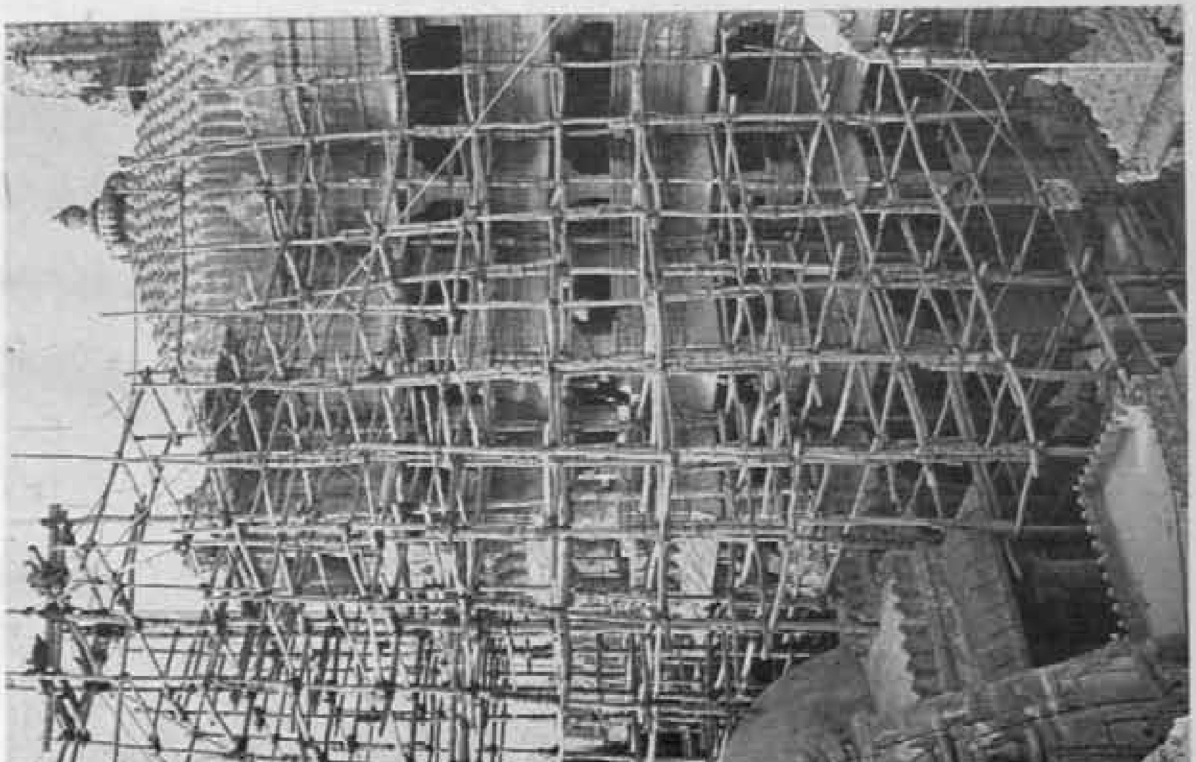


A

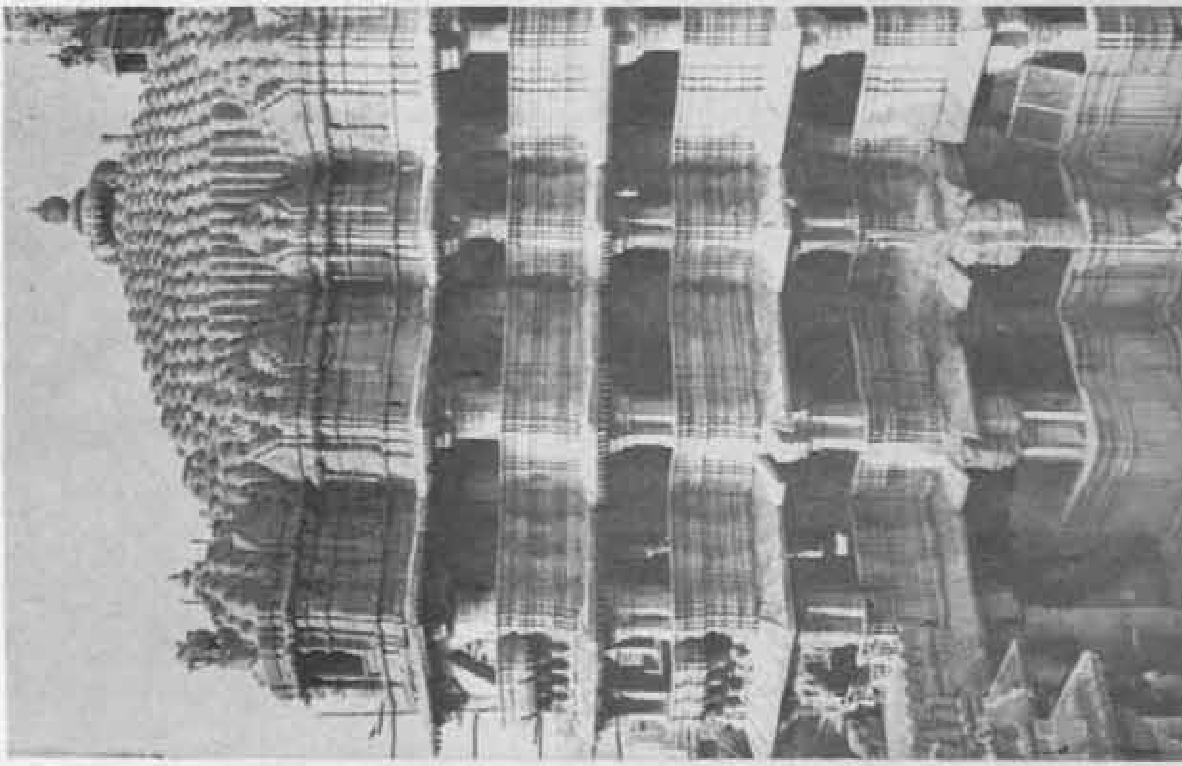


B

Leh : *Stupa at Tisseru*. A, *before and* B, *during scientific clearance and conservation. See p. 203*



A



B

Dwarka : Dvarakadhisha temple, western porch, A, during and B, after conservation. *See p. 206*

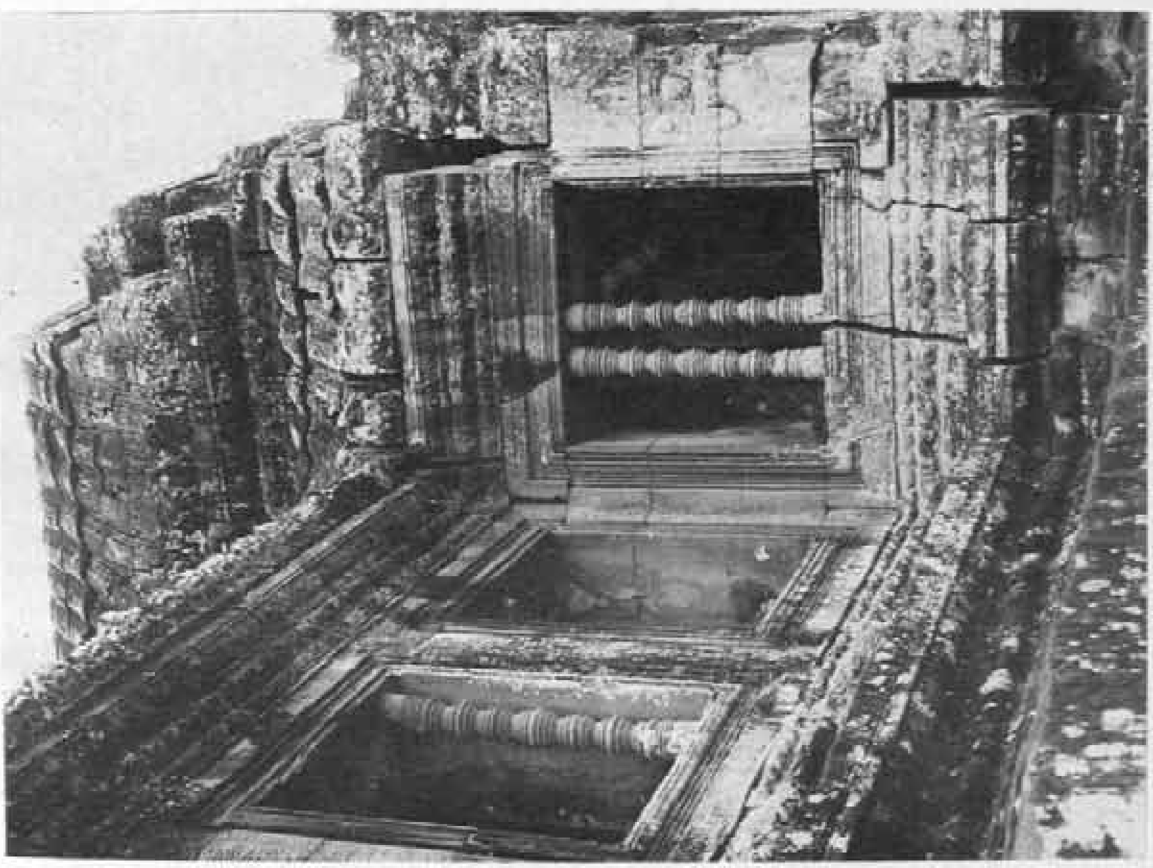


A

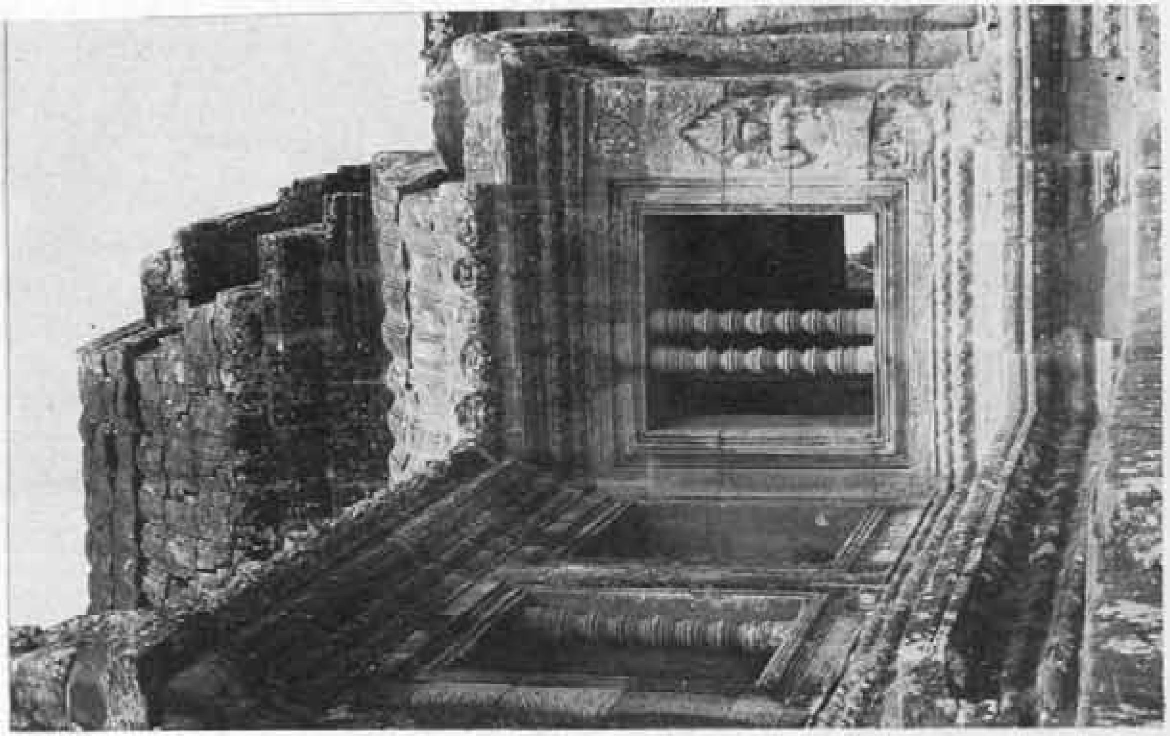


B

Patan : Rani-ki-Vav, southern wall, A, *before and* B, *after conservation. See p. 206*



A



B

Siemreap, Cambodia: Angkor Vat temple, part of Northern Library in between third and fourth enclosure,
A, before and B, after conservation. *See p. 210*

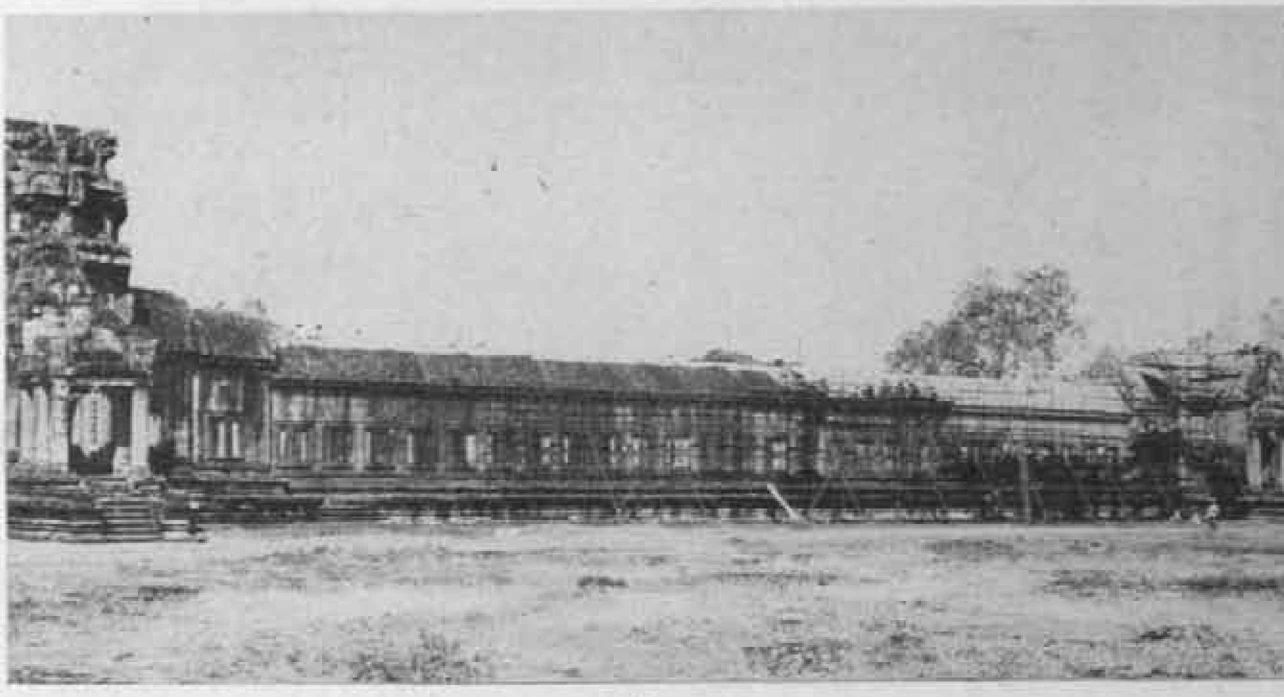


A

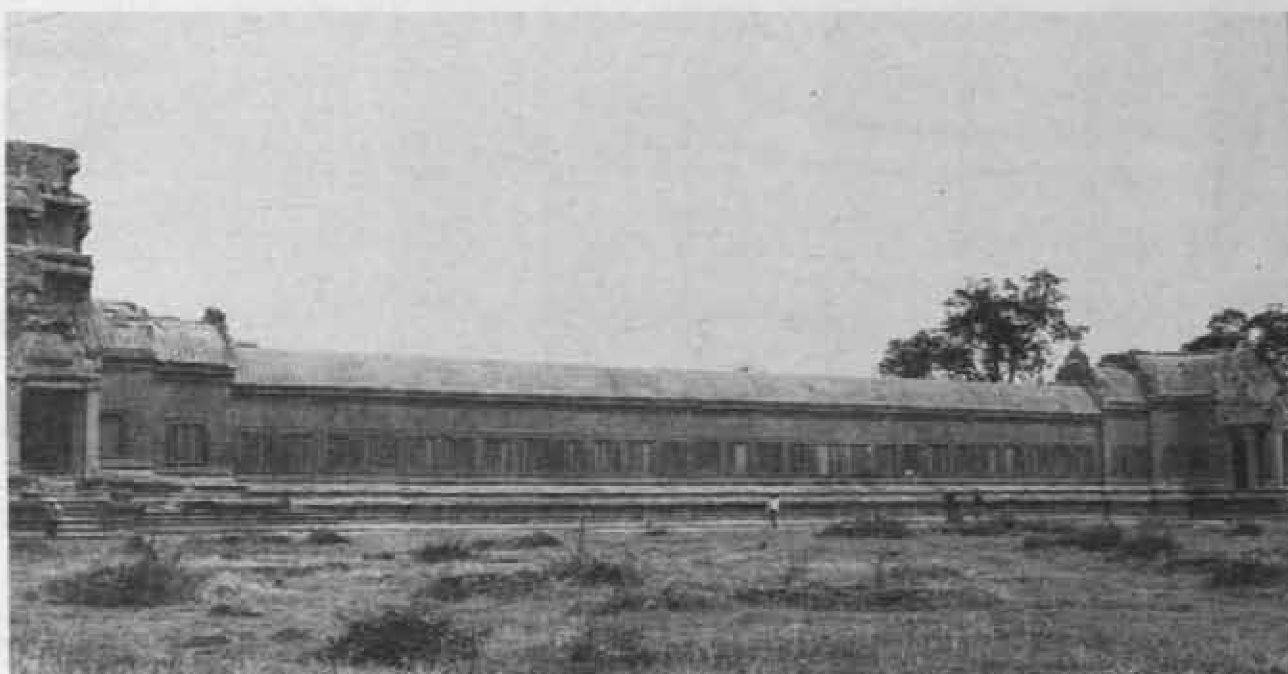


B

Siemreap, Cambodia : Angkor Vat temple, Southern Library, A, before and B, after conservation and chemical treatment. *See p. 210*



A



B

Siemreap, Cambodia : Angkor Vat temple, western gate facing east, A, during and B, after chemical treatment. *See p. 210*

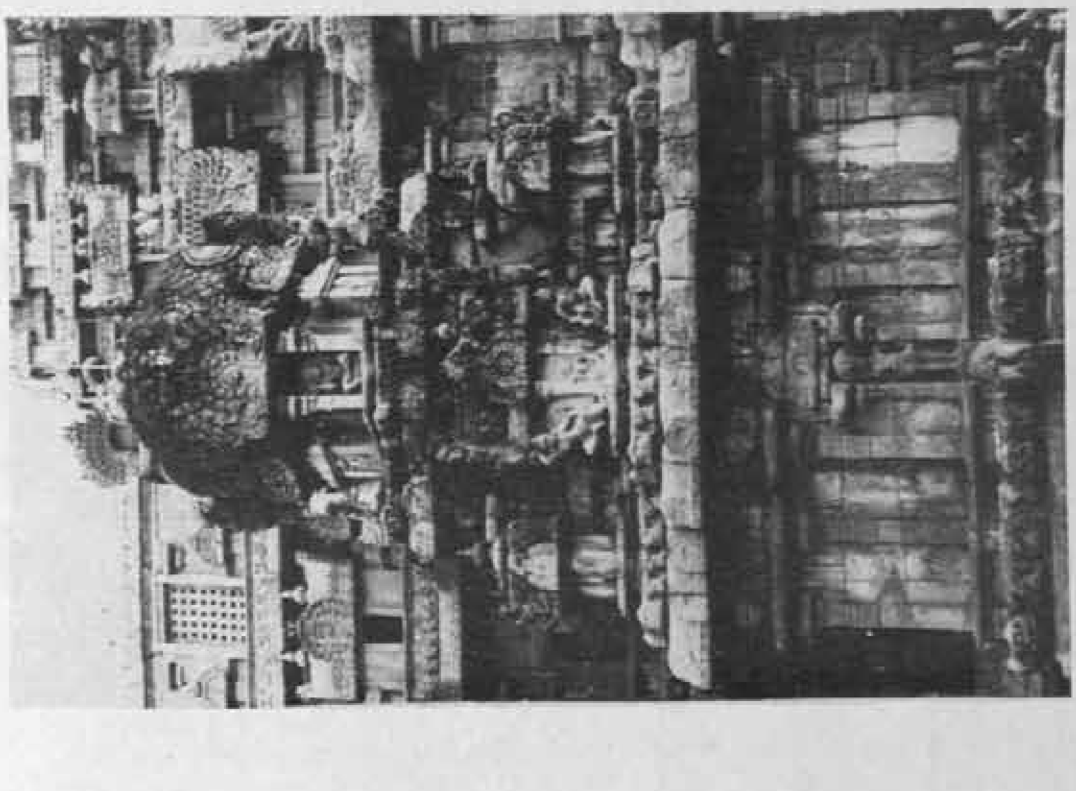


A

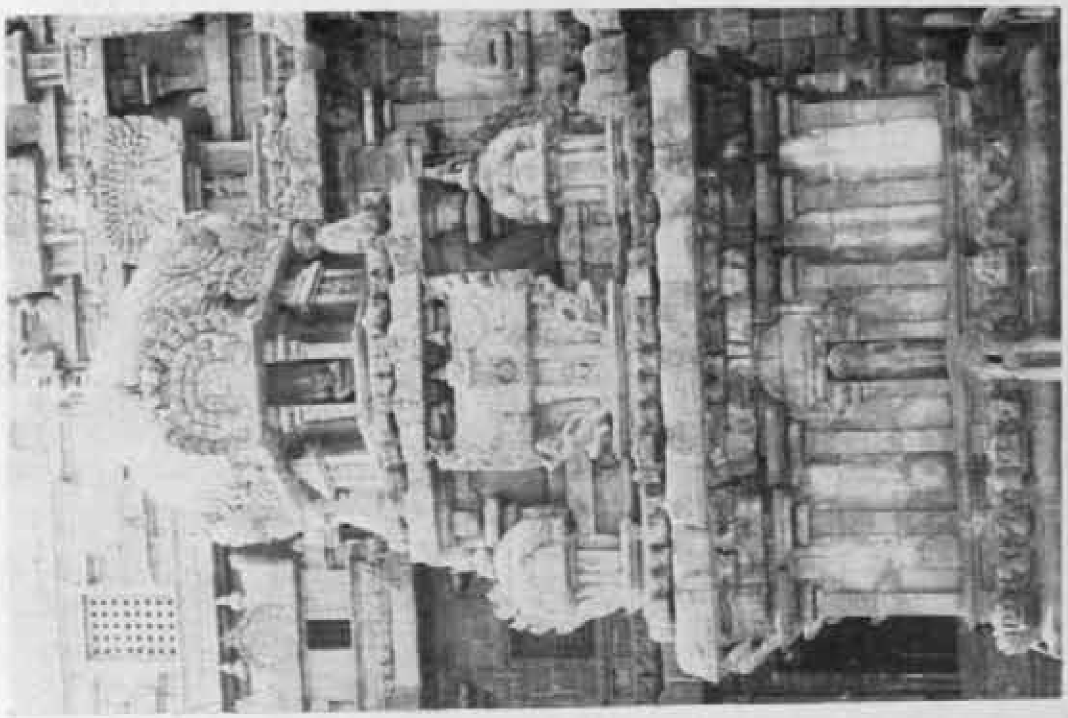


B

Bhubaneswar : Muktesvara temple, A, before and B, after chemical treatment. *See p. 217*



A



B

Thanjavur : Brihadisvara temple, vimana, A, before and B, after chemical treatment. *See p. 218*



A



B

Murshidabad : Hazarduari Palace, A, before and B, after chemical treatment. *See p. 220*